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The #1 Apple II Magazine

FEBRUARY 1987
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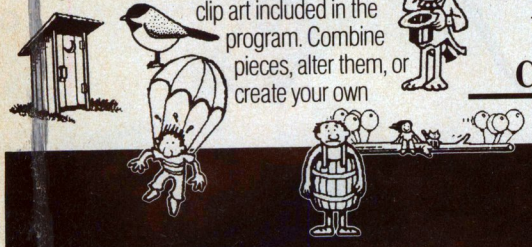

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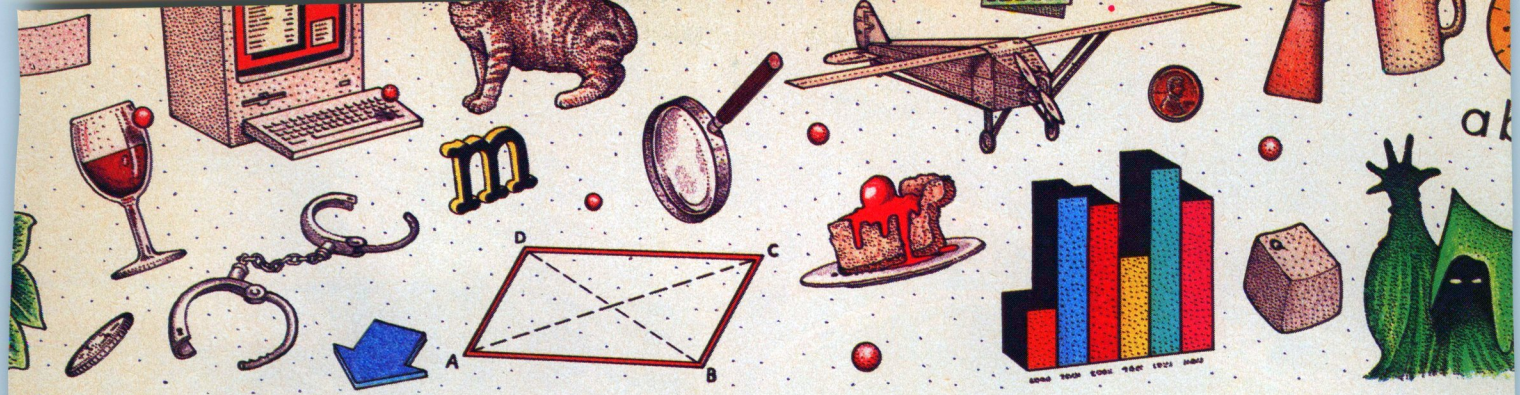
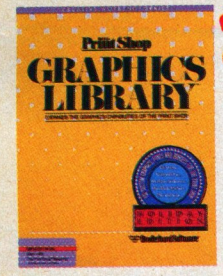


GOT A NEW COMPUTER.



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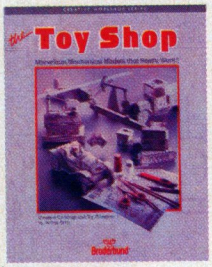

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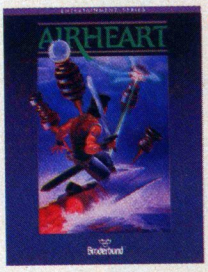

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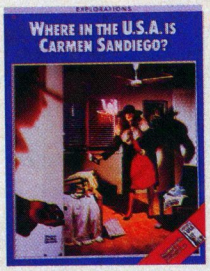

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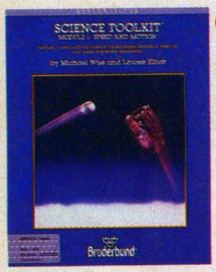

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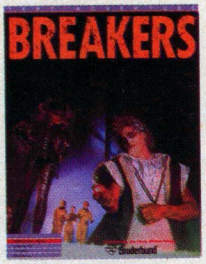

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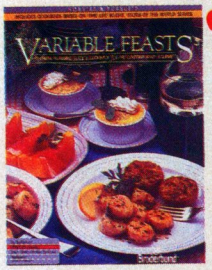

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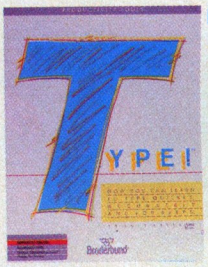

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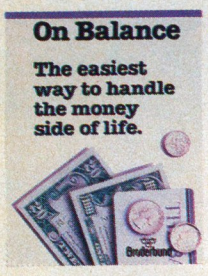

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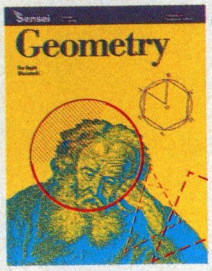

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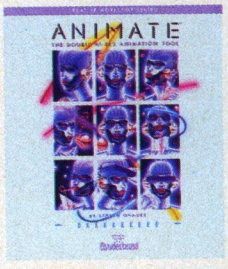

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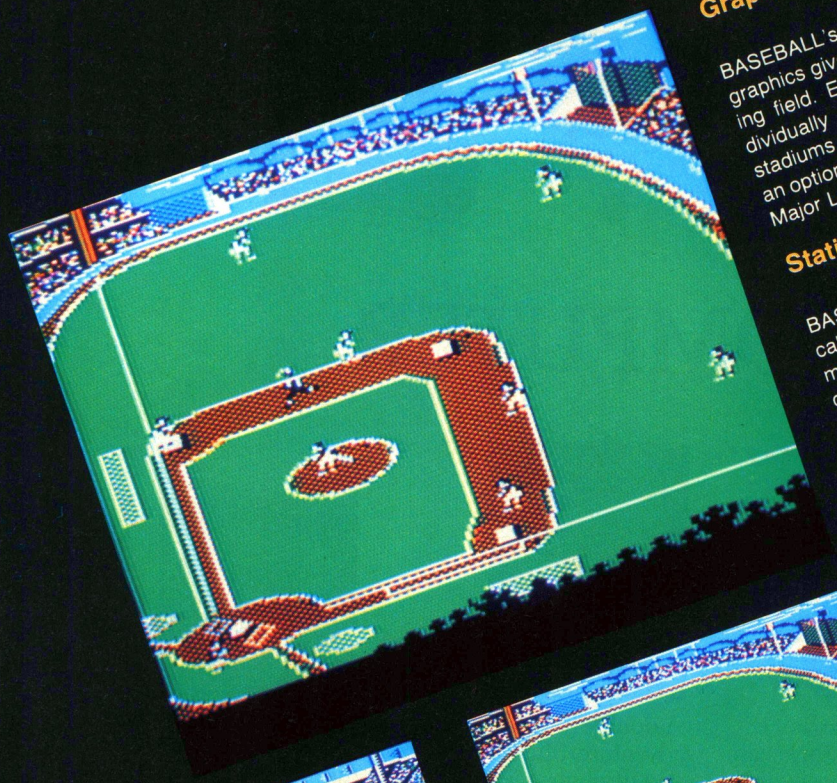

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IIGS UPDATE

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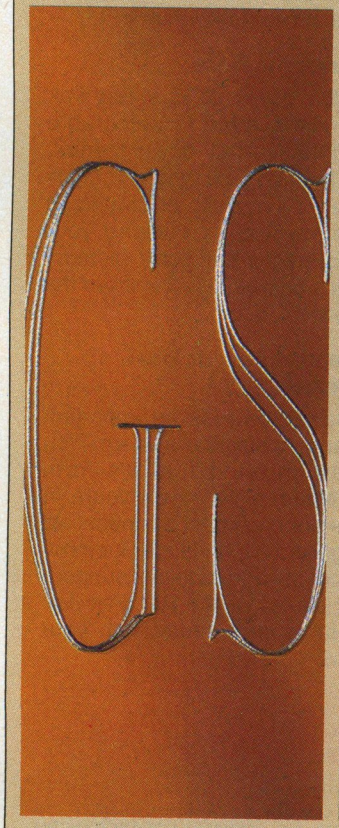
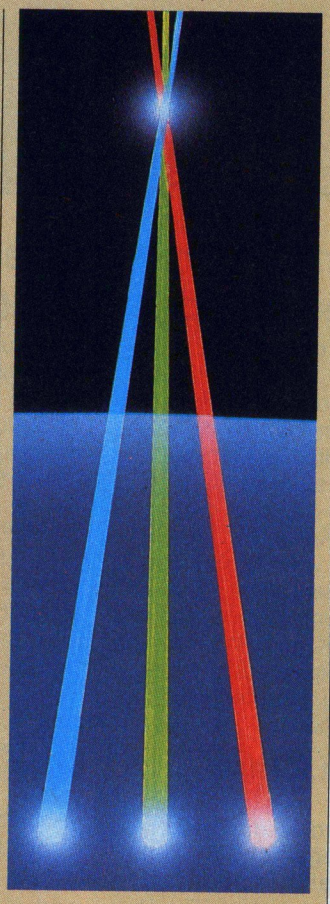
UPGRADING TO THE IIGS
BY GARY B. LITTLE
Apple will soon provide a IIGS upgrade kit for IIe owners. But that's only one way to step up to the power of the IIGS. No matter which approach you prefer, you can take many of your old peripherals and software programs along with you.





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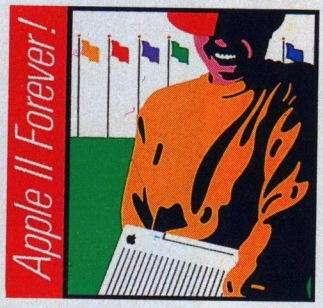

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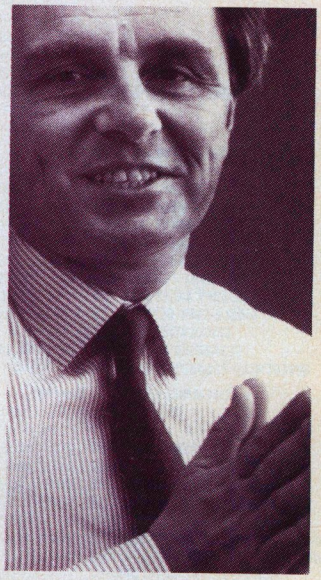

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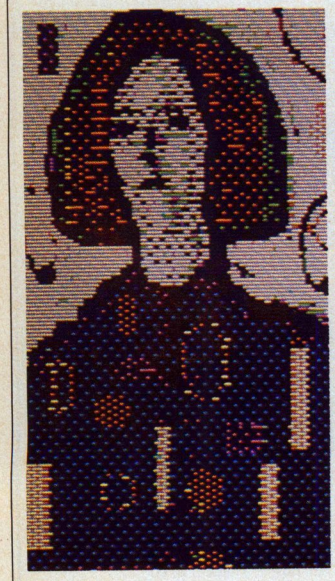

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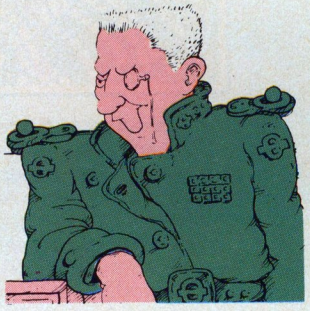

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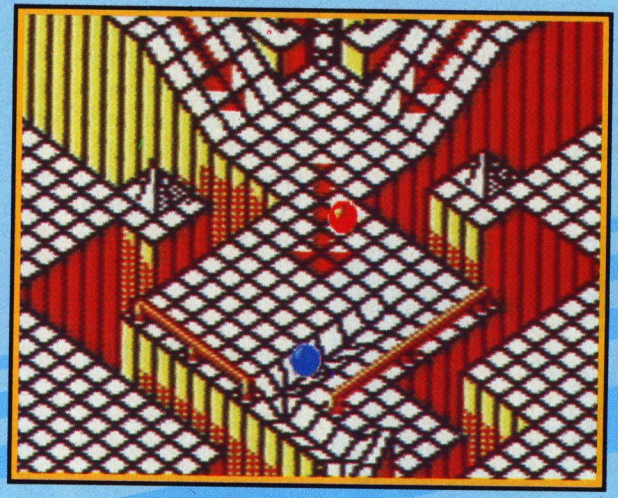

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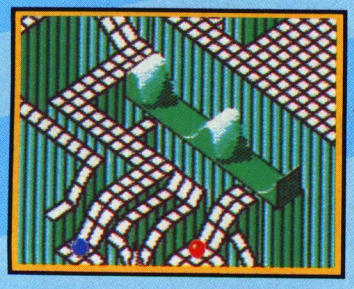

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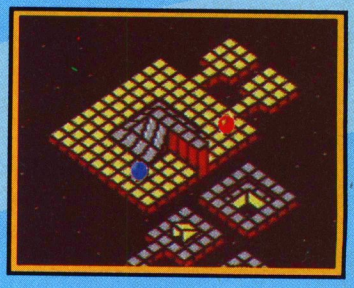

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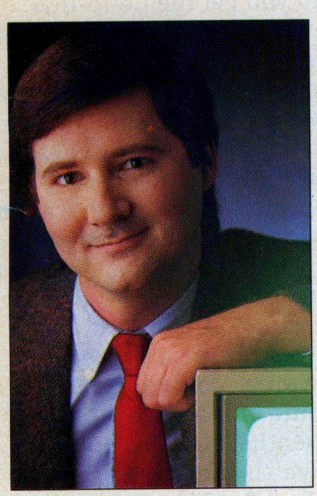

As soon as production of IIGS system units is running smoothly, Apple will begin shipping the long-awaited IIe-to-IIGS upgrade kits.

THE UPGRADE DEBATE

Apple is still catching up on the huge backlog of IIGS orders that have piled up as a result of the production delays that have plagued the IIGS since its introduction last fall. As soon as production of IIGS system units is running smoothly, Apple will begin shipping the long-awaited IIe-to-IIGS upgrade kits.

The Apple IIe-to-IIGS upgrade kit allows IIe owners to take their system unit to their dealers and have their old computer turned into a functional equivalent of the Macintosh-like IIGS for about $500. Although the computer you wind up with looks like the IIe, it is actually a true IIGS.

Smart Move for Apple

There is little doubt that the Apple IIe-to-IIGS upgrade is another marketing coup for Apple. The upgrade not only gives IIe purchasers a reward for buying an Apple product, but it also gives prospective customers a sense of security about making the decision to buy an Apple computer. Apple offered Macintosh owners upgrades from 128K to 512K to Mac Plus, and now it is offering IIe owners an upgrade to the more powerful IIGS.

Many people are reluctant to buy a personal computer because they are afraid it will rapidly become outdated or eclipsed by another model. Apple's upgrades help address this fear and probably will steer a significant number of fence sitters toward their local Apple dealers and away from competitors.

Other Paths

The IIe-to-IIGS upgrade kit is not the only way to upgrade. Even though buying the upgrade kit may be the path of least resistance, it may be better for you to sell your Apple IIe system (or some part of it) and get a genuine IIGS in the spiffy new gray case with the designer-styled keyboard and mouse. Also, if you happen to own a II, II Plus, or IIc, the IIe-to-IIGS upgrade kit isn't an option for you—selling the old to buy the new is the only way to go. Most people have more money invested in their software and peripherals than they do in their system unit; your investment in these items is retained when you swap system units because most software and peripherals for the older 8-bit Apple II's work just fine with the new 16-bit IIGS.

Not everyone thinks upgrading to the IIGS is a good idea. Many people tell me they are content with their current systems. Others feel that the IIe is more reliable than the IIGS. And some people simply can't afford to upgrade. Another factor to consider is whether adding a hard disk, more memory, and an accelerator board to your existing system would give you the best performance increase for the price.

In a few months there will be yet another attractive option: You will be able to upgrade an Apple II to MS-DOS for about the same price as the IIGS upgrade kit.

We know of two prominent Apple hardware developers that are currently working on MS-DOS options for the Apple II series, Orange Micro of Grappler fame and Applied Engineering of RamWorks fame. Orange Micro's product is an external box for the IIGS code-named "DOS Boot." The box houses a shrunken-down PC clone that includes an 8088 processor and an MS-DOS-compatible disk drive. Applied Engineering's product, code-named "Little Blue," is a plug-in board that works with the Apple II Plus, IIe, and IIGS. Little Blue has many niceties, such as the ability to read and write Apple and MS-DOS diskettes with the same disk drive, the ability to use existing Apple II resources such as clocks and hard disk drives, and a speedy 8 MHz 8088 processor that runs faster than a standard IBM PC.

MS-DOS seems like a logical next step for the multitude of Apple II

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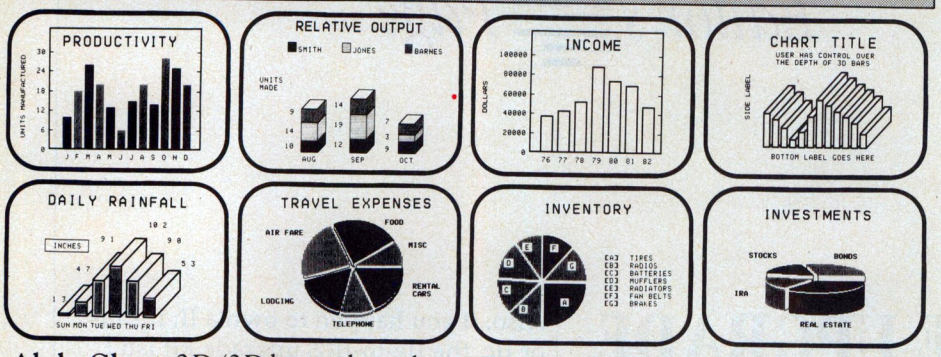

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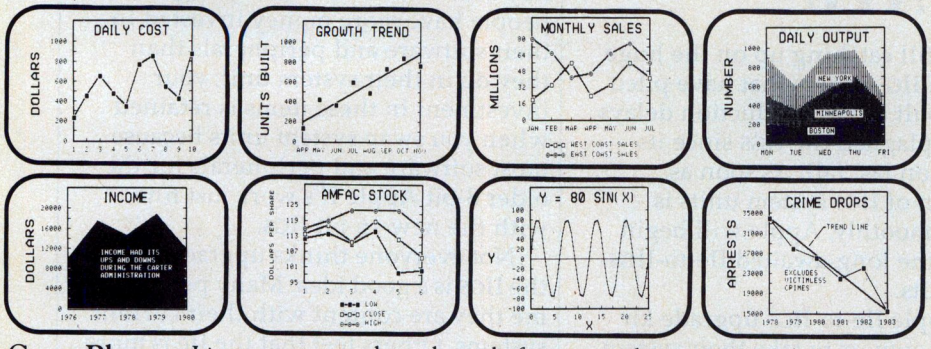

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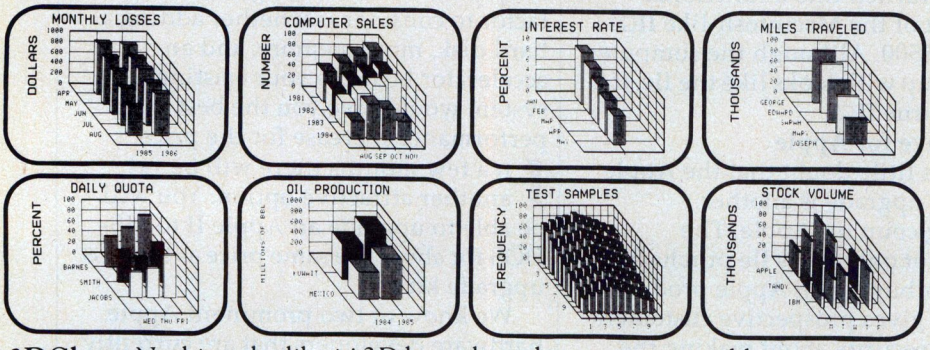

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CP/M users. MS-DOS started out as a 16-bit knockoff of CP/M, and the two operating systems use many of the same commands. Also, CP/M on the Apple II is used primarily for dBASE II and WordStar; users of these two programs may find it appealing to upgrade to programs such as dBASE III Plus and WordStar 2000, which require MS-DOS.

Many Choices

Should you get the IIe-to-IIGS upgrade kit? Should you try selling your current Apple II to buy the IIGS? Should you just soup up your current system? Or should you just stay with what you've got? These tough questions are now facing all Apple II users, and we at *A+* want to help you make the decision that's right for you. To find out more about the ins and outs of upgrading, see our cover story, "Upgrading to the IIGS," by Gary Little; this month's "Thoughtware" column, "The Human Side of Upgrading," by Steve Rosenthal; and an educator's perspective "Is the IIGS Upgrade a School's Best Buy?" in David Thornburg's Learning Curve column. In addition to providing this month's coverage, we'll continue to track the progress of the IIGS in upcoming issues, and we'll be sure to keep you posted on MS-DOS upgrade options as soon as the hard facts are in.

I've been struggling with the upgrade debate myself for quite a while, and I think I've finally made up my mind about what I'm going to do. I'm going to get the IIe-to-IIGS upgrade kit because selling my system is too much of a hassle; besides, I've grown fond of my familiar Apple IIe, and the idea of having a high-powered IIGS system inside my old IIe case has a certain charm. When the MS-DOS options are available, I'll plug one of those into the system and have the best of three worlds: The vast world of MS-DOS software; the vast world of Apple II software; and the growing world of Macintosh-like IIGS software. Whichever decision you make, there's no denying that the Apple II is the world's most versatile computer.

Fred

FREDERIC E. DAVIS/**EDITOR IN CHIEF**

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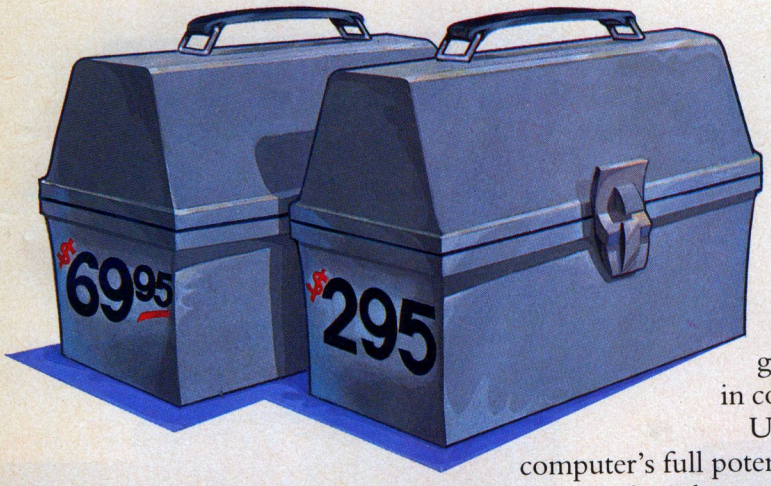

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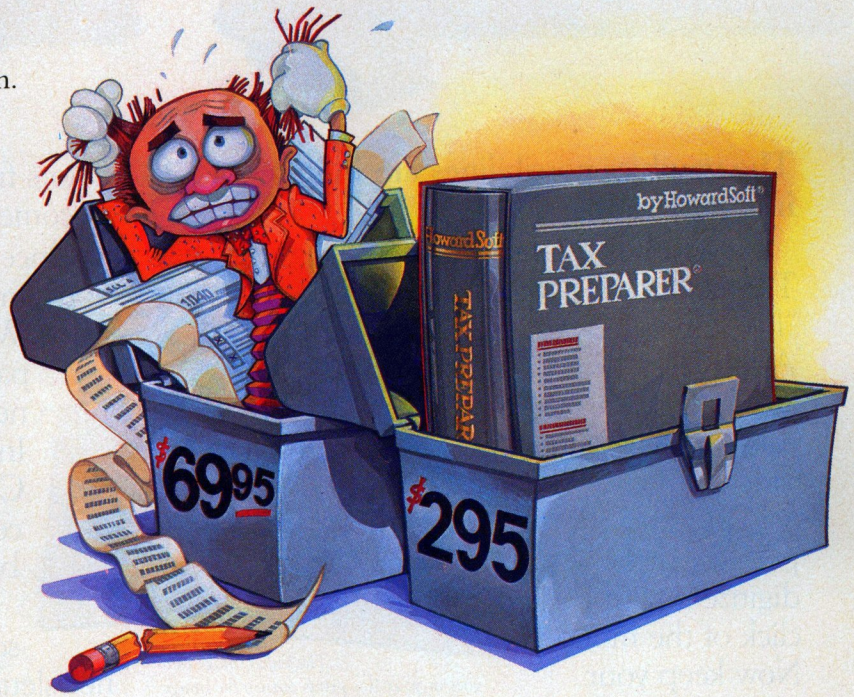

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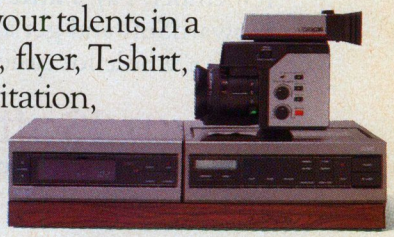

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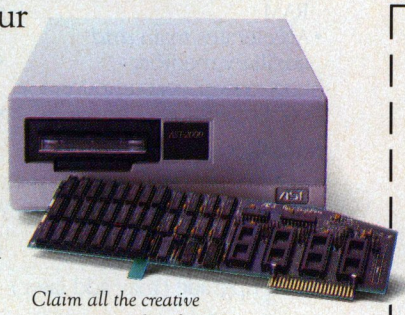

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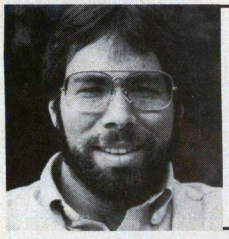

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Steve Wozniak, the creator of Apple Computer

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Letters

We invite your comments.

THE IIc ISN'T 'CUTE'

Dear A+: I want to use your column to express my exasperation with people's attitudes (especially salespeople's) toward the Apple IIc.

A few weeks ago, while in a computer store to check out the new IIGS, I overheard a customer (bringing in his Macintosh for service) look at the IIc and remark to the salesman: "What a cute little computer. I have a good mind to buy one for my kids." Today, while attending an Apple products promotion at a local shopping mall, I overheard the salesperson describing the Apple product line by saying: "This is our IIc, the perfect beginner's computer."

I have owned a IIc for 18 months, and I am currently using it to run two businesses with combined sales in excess of $2 million. It handles my most advanced BPI accounting packages. The IIc handles my payroll, a 3000-person customer database, 1000 mailing labels per month (it is the key to my direct-mail program), several 85K spreadsheets, menu and brochure layouts, and a check-writing program for my smaller business. When I have finished using it, my IIc teaches my kids algebra, multiplication, and spelling, and it entertains them with The Print Shop and a few dozen other software programs.

I have added a 3.5-inch drive, an external 5¼-inch drive, an ImageWriter II, a mouse, 528K of additional memory, a modem, MacroWorks to enhance the speed of my AppleWorks program, and Catalyst to handle all my business programs on one disk, and I have ordered an external numeric pad to process numbers faster. And all this takes up less than 1½ square feet of my desk (so I have room for other things such as a telephone and a calculator).

It has given me the ability to crunch massive amounts of sales data otherwise impossible to analyze by hand-accounting methods. I can chart and print graphs, and my accountant receives flawless data to construct my financial statements (those statements that the computer doesn't already do for me). The computer prints checks that make my smaller business look like a multinational conglomerate to the people I do business with! I am starting to transmit data files 2000 miles away to a business associate in California. I haven't even begun to discuss the hours of time I save each week over old-fashioned hand-bookkeeping methods or the money I save in accounting fees.

Does it sound as though I like this thing? I wouldn't trade it for a IIGS, a Mac, or an IBM PC/AT. It paid for itself in the first month of operation, and it has never once been back for service (nor has any component, except to enhance the motherboard for the new 3.5 UniDisk).

So I don't want to hear my IIc described in terms of *cuteness* or *beginner's* anymore. The IIc's only limitations are those of its owners.

Mark Strothman
Milwaukee, WI

GRANNY SMITH?

Dear A+: After seeing the new Apple IIGS firsthand, I would suggest that it was really named after the most delicious apple of them all, the Granny Smith.

Kenneth D. James
Jessup, MD

II PLUS MINUS UPGRADE

Dear A+: Your November 1986 editorial struck a responsive chord in me and probably a considerable number of other Apple II Plus owners as well. You stated, "The IIe-to-IIGS upgrade is great, except that II Plus and IIc owners are left behind." Amen to that! I also agree with your statement that "II Plus owners should at least have been able to upgrade to a IIe."

I've been waiting quite a while for Apple to give those II Plus owners who covet a IIe or IIc some sort of upgrade path, but to no avail. With the introduction of the IIGS, I thought the price of the IIe and IIc would drop a little, but I certainly can't see any difference.

I know there are others like me among your readers. Every time we read a review of a really neat program, we get to the system requirements and read "Apple IIc or IIe with 128K RAM." That gets discouraging after a while.

Come on, Apple . . . loosen up a bit! Offer II Plus owners a way to upgrade our machines, and we'll love you for it.

H.G. Payne, Jr.
Bedford, TX

ORPHANED APPLES

Dear A+: My November issue of *A+* just arrived and is completely covered with articles about the new Apple IIGS. As I read each article, I was impressed. The new Apple II has everything that had been promised and more—great graphics and sound capabilities plus memory expansion that would make any other computer's monitor turn green with envy. I read about the upcoming software for the new II, the great possibilities it could have in the classroom, and the new peripherals that would be introduced. It sounded like an Apple lover's delight!

Then it hit me. These were the same types of article I read so intently two years ago when I was search-

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ing for a replacement for my abandoned TI-99/4A. Then the new computer on the block was the "new" Apple IIc and was billed as the "everything you'll ever need is in there" computer. My wife is a third-grade teacher with Apples in her school, so what better computer to buy, right? Wrong!

Now I read no upgrade is planned for the II Plus or the IIc. I find that "all I'll ever need" just won't be enough. The new hard disk is a great device if you're a IIe or IIcs owner, but it's no good for my "closed" IIc. (It is an Apple, isn't it?) If that isn't bad enough, even my color stands out in the new all-gray crowd!

Well, I guess I'll stick with my trusty IIc, Apple monitor, and Apple printer (even though they are just white) and wait for Applied Engineering or some of the other fine companies to keep coming up with innovative "goodies" to keep my IIc up to date. Believe me, that's cheaper than getting a new computer every two years.

Glen Seigler
Walterboro, SC

WARNING! DOES NOT WORK WITH MOUSE

Dear *A+*: I am writing to let you know of a slight hardware/software problem I had. Not too long ago, I purchased an Apple IIc system from my local dealer. Things seemed to be going along great until I kept running into software that would not work with the mouse, just the joystick. The software was The Newsroom and Graphics Expander from Springboard and the software that goes along with the X10 Powerhouse computer interface. I took the software over to a friend who has an Apple IIe, and it seemed to work fine, so I discounted it as a compatibility problem between the IIe and the IIc. The whole deal was really bothering me, so I took the suspect software down to the dealer that I purchased the IIc from and tried it out—everything worked!

This is what I found out:

In October 1986 Apple released a *new* version of the IIc. This version has platinum-colored keys and a new motherboard, equipped for the new plug-in memory-expansion card that Apple also introduced. My dealer discovered in an Apple II

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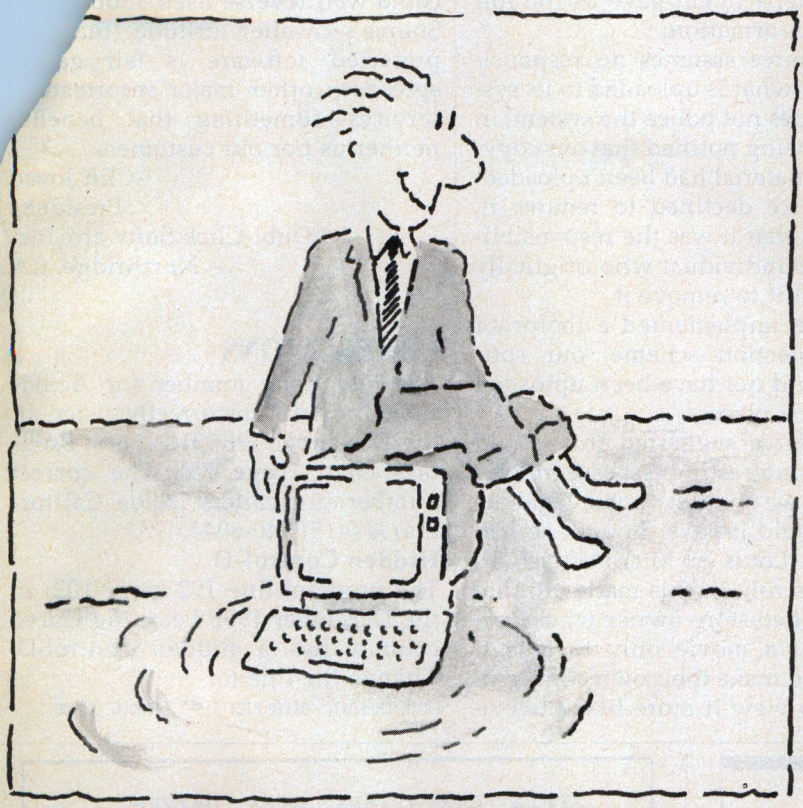

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compatibility guide that the above-mentioned software does not work with the IIc. Well, it does work, just not with a mouse. An Apple representative in the store at the time said there was no difference between the two machines.

I am proud to say that within a few minutes the Apple dealer (The Computer Terminal, Santa Maria, CA) had an "older" style motherboard in my computer, humming along just fine. Having moved to Apple from Atari, I was amazed with the service I got from the dealer—something I never would have achieved with Atari Corporation.

Richard W. Hawley II
Santa Maria, CA

A SOURCE OF TROUBLE

Dear *A+*: Your November 1986 "NewsPlus" column discussed recent events regarding pirate BBSs. Although we most definitely applaud the action taken by the SPA against the Star Chamber, we wish to disagree with the general comment that commercial services usually police their own systems. Our own recent experience with The Source indicates otherwise. Recently, we discovered that a portion of one of our commercial software packages had been uploaded to The Source and made available to all subscribers without our knowledge or permission. The Source's customer-service department gave us the following information:

- The Source assumes no responsibility for what is uploaded to its system. It does not police the system; in fact, on being notified that our copyrighted material had been uploaded, The Source declined to remove it, claiming that it was the responsibility of the individual who originally uploaded it to remove it.
- Had we implemented a foolproof copy-protection scheme, our software could not have been uploaded in the first place.
- The Source suggested this would make an interesting test case (implying that we should pursue legal action? Would it have thought so had we been Lotus or Microsoft?) It likened its role in this matter to that of the video-store owner whose clients rent a movie only to take it home and make their own copy of it. I tend to view it more like a television station that rents a copy of *Top Gun* from the video store and then exhibits it for free over the

Our company does no use copy-protection sch fear, however, that the trend away from copy pr could well reverse itself shou Source's cavalier attitude (tha protected software is fair ga spread to other major informati services—something that benefi neither us nor our customers.

Cliff Joyce
President
Dubl-Click Software, Inc.
Northridge, CA

CORRECTIONS

The telephone number for Activision, Inc., was incorrectly listed in the December 1986 IIGS New Products chart (page 78). The correct number (for callers inside California) is (415) 940-6044.

Hidden Control-D

The program line 192 (page 102) in the December 1986 Learning Curve column has a hidden control-D. Change the line to:

```
PRINT CHR$(4);"BSAVE PICT";S;",A$2000,L$2000"
```


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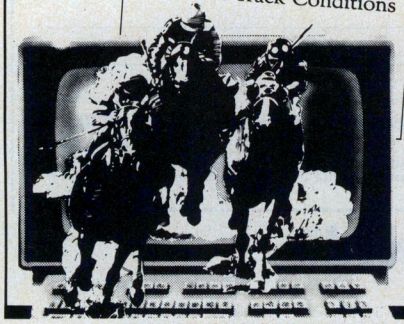

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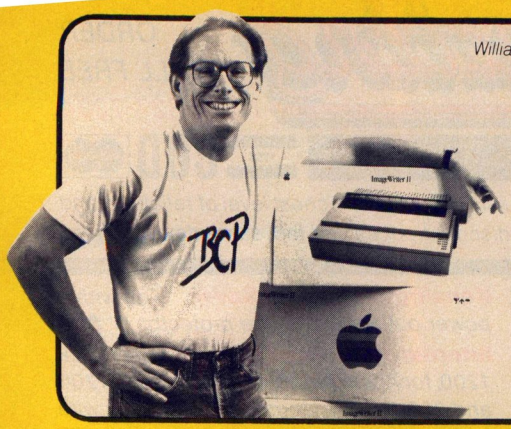

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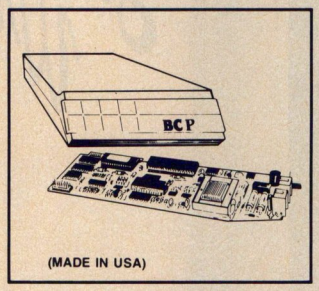

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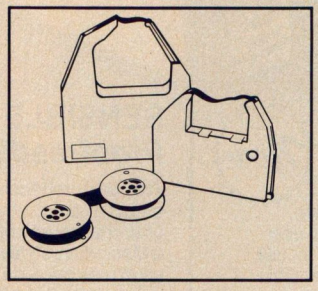

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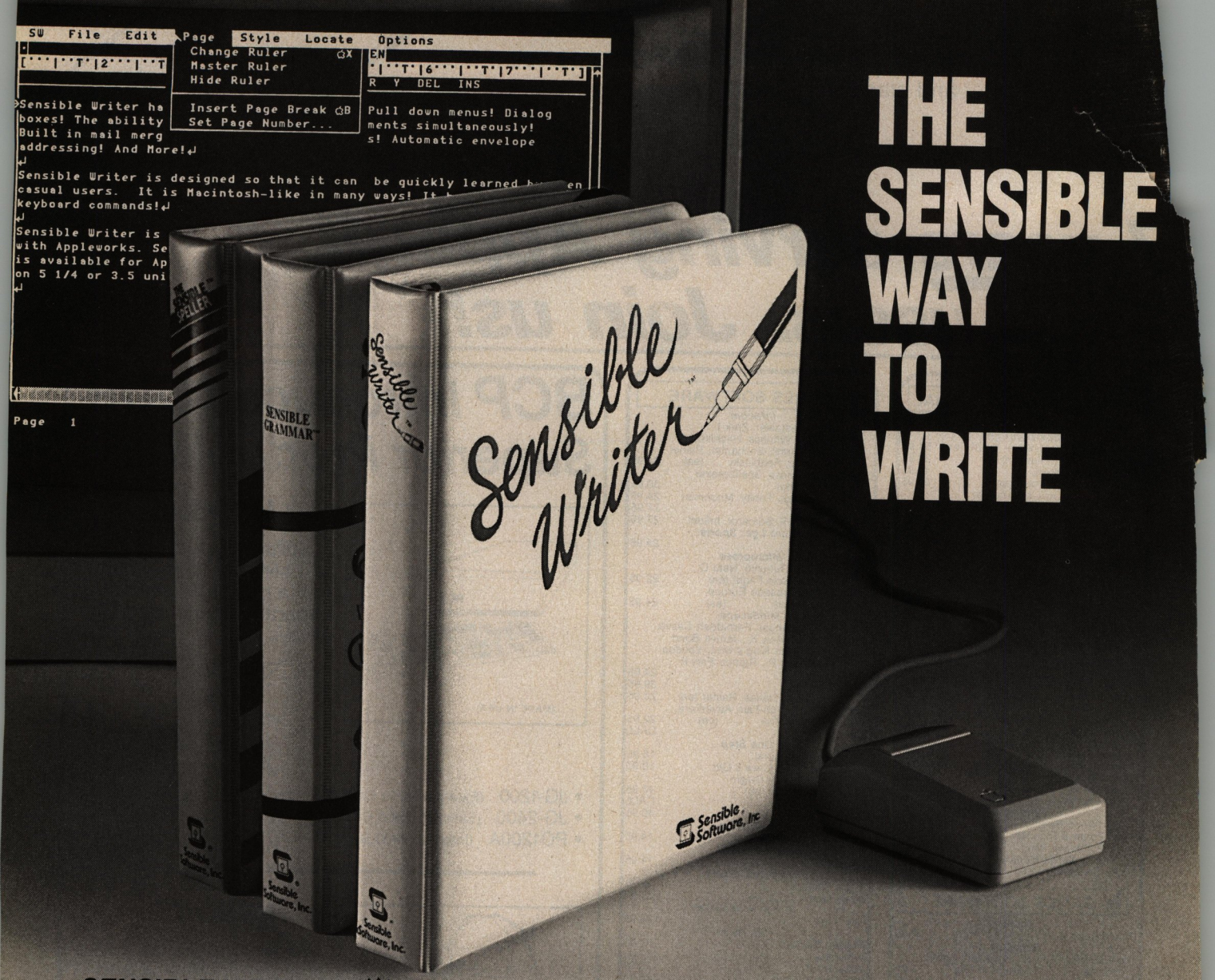

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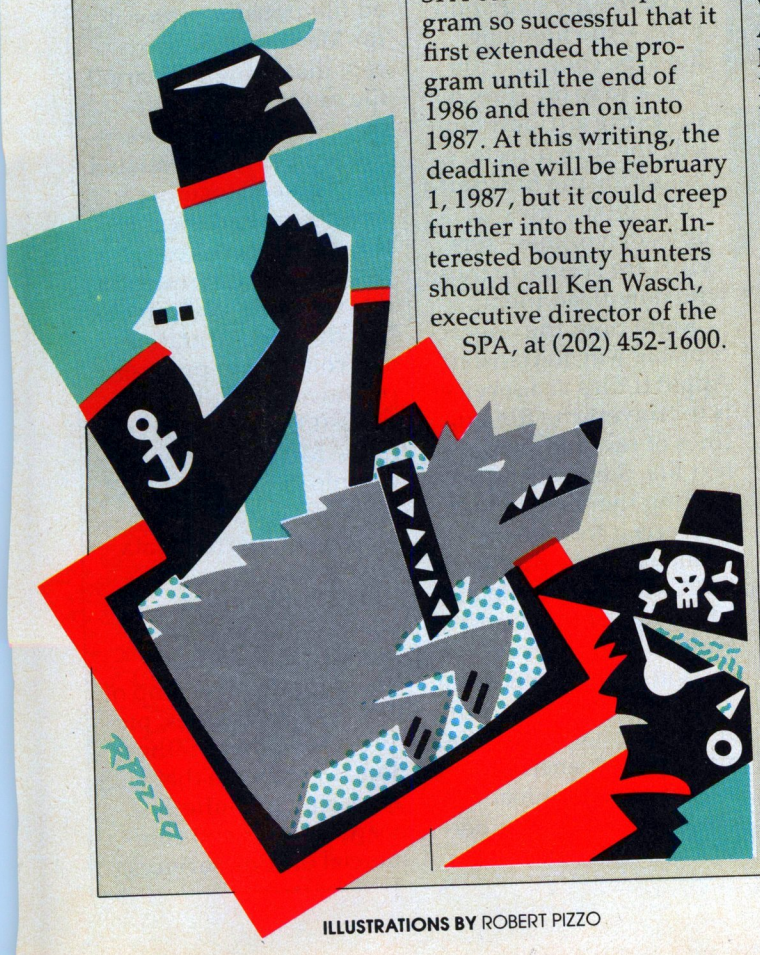
CIRCLE 165 ON READER SERVICE CARD

BY LISA RALEIGH AND CHIP CARMAN

NewsPlus

The Software Publishers Association has paid $1300 so far in rewards to individuals who report 'prosecutable' pirate bulletin boards.



ILLUSTRATIONS BY ROBERT PIZZO

BOUNTY HUNTER

The Software Publishers Association reports significant success with its program that awards a $100 bounty to individuals who report "prosecutable" pirate bulletin boards. As of early November, the SPA had paid out $1300 in rewards, $600 of which went to a single, enterprising individual in California. The SPA considers the program so successful that it first extended the program until the end of 1986 and then on into 1987. At this writing, the deadline will be February 1, 1987, but it could creep further into the year. Interested bounty hunters should call Ken Wasch, executive director of the SPA, at (202) 452-1600.

WHICH PROGRAMS WORK?

When Apple introduced the IIGS last fall, it provided dealers with a compatibility guide listing the results of Apple's tests on 300 Apple II programs. As might be expected, a few glitches arose, and Apple has published an addendum, explaining which programs *do* work with the IIGS that it previously said did not. Among the seven titles listed are Computer SAT Preparation by Harcourt Brace Jovanovich, Pinpoint by Pinpoint Publishing, and Quicken by Intuit.

Other corrections concerned the ability of certain packages to work with special IIGS features, such as the control panel. In all, the addendum contained a mere 14 corrections. But the bottom line is this: If you're wondering if your old software works with the IIGS, the best bet is to call the publisher—or take the program in question into the store with you.

After all, a dealer with even the most current version of the compatibility guide has information about only 300 of the thousands of Apple II titles.

TESLER TAPPED

Apple Computer, Inc., wants to maintain its leadership position when it comes to technical innovation and has confirmed that commitment with an executive appointment. Apple recently named Larry Tesler, 41, to the newly created position of vice president of advanced technology. Tesler will also be a member of Apple's executive staff, meaning that the advanced-development group will be intimately involved in the company's long- and short-range planning.

PHOTO COURTESY OF APPLE COMPUTER, INC.

And what sort of background does Tesler bring to this powerful position? Tesler has been at Apple for six years and is probably best known in the industry for his management role in the development of the now-defunct but then-revolutionary Lisa system. He is also a veteran of Xerox's Palo Alto Research Center (from which Apple has borrowed many user-interface developments) and Stanford University's Artificial Intelligence Laboratories. One Apple

NewsPlus

The National AppleWorks Users Group is offering seminars across the country.

insider suggests that Tesler might pursue the old Xerox PARC/Alan Kay notion of the Dynabook, a notebook-size computer.

APPLEWORKS ALERT

Here are a couple of items that came to our attention after the deadline for this month's "AppleWorks Report":

The National AppleWorks Users Group is offering half-day seminars across the country. The topic is "Beyond the Basics," and the fee is $40 for members and $45 for nonmembers. (Membership in this group costs $24, which also entitles you to a newsletter, public-domain software, discounts on products and seminars, and access to an electronic bulletin board.) Several seminars have already taken place in the Midwest, but the group plans more on the East and West coasts. For more information, call NAUG in Canton, Michigan; (313) 397-1594.

Our other item concerns Bob (aka Rupert) Lissner, the programmer who wrote AppleWorks. Lissner has started an on-line bulletin board that supplies technical information to programmers who want to modify AppleWorks or write programs that work with it. The number to call is (702) 831-1722.

UNIQUE COPY PROTECTION

The Software Publishers Association program pays $100 to individuals who offer information leading to the shutdown of bulletin-board systems that offer pirated software, and the ADAPSO Software Protection Committee has set aside $45,000 for an antipiracy campaign to combat illegal copying of software at universities.

But Rabbi Alan Rosenbaum believes his company, Davka Corporation, may have a unique solution that is equally effective. The Chicago company specializing in religious-education software has the following words emblazoned on its diskettes: "UNAUTHORIZED REPRODUCTION OF THIS DISK IS IN VIOLATION OF THE BIBLICAL COMMANDMENT AND MAY BE AGAINST FEDERAL AND STATE LAWS." In other words, God will getcha if you don't watch it.

FILE-TRANSFER STANDARD PROPOSED

In November, writer and software author Gary B. Little proposed an Apple II Binary File Format standard that would make file transfers to commercial information services such as CompuServe, Delphi, GEnie, and The Source simple and convenient. Currently, transferring Apple II files in binary form to commercial information services is frustrating. Although these services are able to receive a file's data in binary form, they don't receive the file's attribute bytes—the filename, file-type code, the file size, and so on. (ProDOS stores the attributes inside the disk directory, not inside the file itself.) Thus, binary files uploaded to these services are useless to those who download them.

Right now, the only acceptable way to transfer Apple II files to a service is to convert the file into lines of text and send the text file. Someone downloading the text file then converts it to a binary form, using the Applesoft EXEC command. The disadvantage of this technique is that the text version of the file is more than three times the size of the original binary file, making it expensive to upload and download. Sending a 32K IIGS super-high-resolution picture using the text-file method would require nearly a 100K text file!

The solution to this problem is to upload a standard encoded binary file that contains not just the file's data but the file's attributes as well. After downloading the file, you must use a conversion program to create the file with the required attributes. This encoding scheme is similar to MacBinary, the widely adopted file-transfer protocol for Macintosh files, except that a single Binary II file can hold multiple disk files, making it easy to keep a group of related files "glued" together when you send them to the on-line service.

```
1011001101000
1100110011001
1111010101000
1010010111010
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If you are interested in this standard, you can obtain the documentation and conversion programs on the major on-line services. (On CompuServe in the MAUG section, download BINARY.DOC, BI2UP.EXE, and BI2DWN.EXE from data library 8.)

We think this proposed standard is well founded and perfectly timed for the new crop of IIGS desk accessories, pictures, and other public-domain software that is appearing on bulletin-board systems and commercial on-line services.

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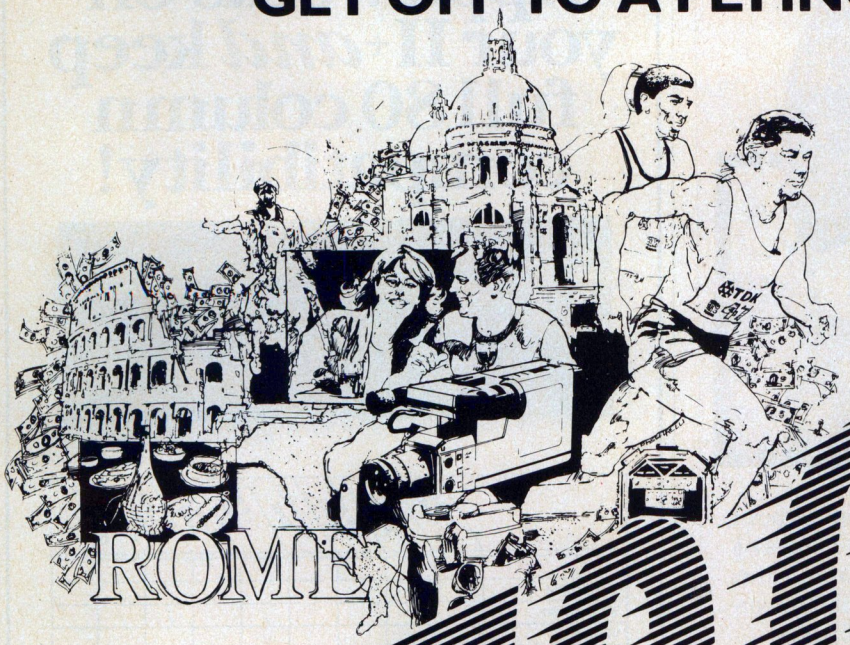

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CIRCLE 172 ON READER SERVICE CARD

NewsPlus

DOS BOOT

No, it's not a subtitled film about a German submarine crew. It's a newly announced product from Orange Micro. DOS Boot, which is scheduled for release in April, is designed to allow you to run MS-DOS applications from a disk drive. Unlike Little Blue (the working name for a similar, upcoming product from Applied Engineering), though, DOS Boot will work only on the IIGS. Little Blue is designed to work with the IIe and II Plus as well.

LOOKING FOR WIZARDS

Many computer stores do not have the expertise to properly service all the hardware and software they sell. But expect to see more specialty bulletin-board systems (BBSs) and users' groups to fill the gap. For example, AST Research offers a BBS to disseminate technical information and software updates.

First Class Peripherals, the manufacturer of Sider (the $499 ten-megabyte hard-disk drive for the II Plus, IIe, or IIGS), is searching users' groups for "Wizards" that it will train. A wizard will be able to make quick, limited on-site repairs of in-warranty products and answer technical questions. The company is asking that Apple users' group presidents submit, in writing, the names of four qualified applicants, and three possible meeting dates. Your users' group must have 300 members, and at least 100 members present at the group meeting the Sider folks attend. For more information or to request a wizard presentation, please contact The Wizard Program, First Class Peripherals, 3579 Highway 50 East, Carson City, NV 89701.

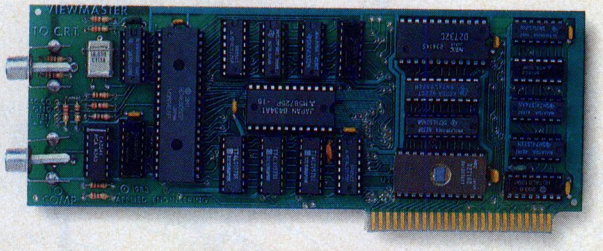
COMPUTERS TO KENYA

Apple has made its first educational grant outside the U.S. to the Aga Khan Foundation's Computers in Education project in Kenya. Apple gave $120,000 worth of equipment—33 Apple IIs, a Macintosh, software, ImageWriter printers, and other peripherals—to the project, which encourages both teachers and students to use computers as tools in the classroom. The project, which began in 1982, has expanded to include 4000 students and 250 teachers.

ILLUSTRATION BY STEVE CAMPBELL

Viewmaster 80

Now run AppleWorks™ on your II+ *and* keep full 80 column compatibility!



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SUPRTERM		✓					✓	✓	
WIZARD 80					✓		✓	✓	
VISION 80	✓	✓			✓				
OMNIVISION		✓					✓	✓	
VIEWMAX 80	✓	✓			✓			✓	
SMARTERM	✓	✓				✓	✓		
VIDEOTERM		✓	✓		✓	✓		✓	

One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

Each Viewmaster 80 includes our powerful AppleWorks expand software, allowing AppleWorks to run on the II+ with only 64K (or more) memory. (We recommend the RamFactor memory card, but any compatible Apple memory card will work.) The software provides our full range of AppleWorks enhancements, including expanded records, word processor, multi-disk saving, time and date display on screen with any PRO-DOS clock, and more!

The Viewmaster 80 works with all 80 column applications, including DOS 3.3, PRO-DOS, CP/M, Pascal, WordStar, Format II, Applewriter II, dBase II, Visicalc, Multiplan, and *hundreds* of others—including AppleWorks.

Here are just a few of the powerful features the Viewmaster 80 delivers for a great price ($149):
• 80 Characters by 24 lines • Fully compatible with all Apple languages and software • Highest compatibility with existing 80 column software • Very low power consumption • High speed (18 MHZ) scroll rate • Upper and lower case characters and true descenders, both inverse and normal; all on-screen editing functions are supported • User-definable cursor shape • Compatible with Apple II, II+ and IIe • Five-year warranty

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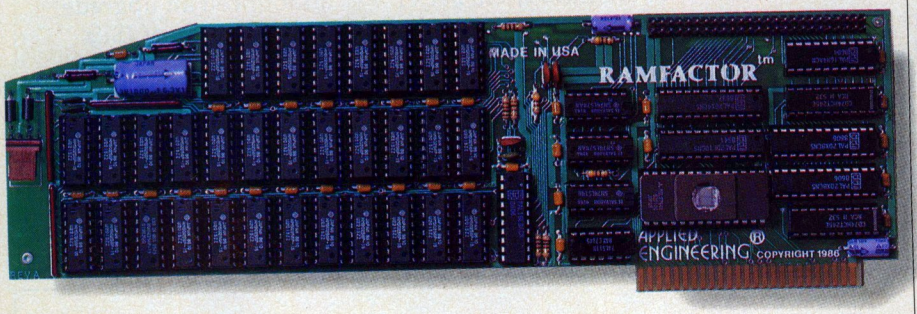
RamFactor™

The Highest Performance, Speed and Software Compatibility of Any Slot 1-7 Memory Card for the Apple II+, IIe or IIGS.

Now anyone with an Apple II+, Franklin, Laser 128, Apple IIe or IIGS preferring to use slots 1 through 7 can now enjoy the speed and performance that they've been waiting for.

With RamFactor, you'll be able to instantly add another 256K, 512K, or a full 1 MEG on the main board and up to 16 MEG with additional piggyback card. And since virtually all software is automatically compatible with RamFactor, you'll immediately be able to load programs into RamFactor for instantaneous access to information. You'll also be able to store more data for larger word processing documents, bigger data bases, and expanded spreadsheets. And with the battery back-up option you can switch on your Apple and any of your favorite software will be up and running in less than 1 second!



Very Compatible

All the leading software is already compatible with RamFactor. Programs like AppleWorks, Pinpoint, BPI, Managing Your Money, Dollars and Sense, SuperCalc 3A, PFS, MouseWrite, MouseDesk, MouseCalc, Sensible Speller, Applewriter IIe, Business Works, ReportWorks, Catalyst 3.0 and more. And RamFactor is fully ProDos, DOS 3.3, Pascal 1.3 and CP/M compatible. In fact, no other slot 1-7 memory card is more compatible with commercial software.

AppleWorks Power

There are other slot 1-7 cards that give AppleWorks a larger desktop, but that's the end of their story. But RamFactor is the only slot 1-7 card that increases AppleWorks internal memory limits, increasing the maximum number of records in the database and lines permitted in the word processor, and RamFactor is the only standard slot card that will automatically load all of AppleWorks into RAM dramatically increasing speed and eliminating the time required to access the program disk, it will even display the time and date on the AppleWorks screen with any ProDos clock. RamFactor will automatically segment large files so they can be saved on 5¼", 3½", and hard disks. All this performance is available to anyone with an Apple IIe, IIGS *or* II+ with an 80 column card. RamFactor, no other standard slot card comes close to enhancing AppleWorks so much.

True 65C816 16 Bit Power

RamFactor has a built-in 65C816 CPU port for direct connection to our IIe 65C816 card for linearly addressing up to 16 MEG for the most powerful 16 bit applications. (II+ 65C816 card under development.)

Powerful Program Switcher

With RamFactor, you can organize memory into multiple work areas and switch between them. Each work area can contain different programs and even different operating systems. Now you can switch from one program to another or even switch from AppleWorks to DOS 3.3 to CP/M to Pascal to ProDos in under a second. And with our Battery back-up option, you can have permanent storage for up to 20 years.

Quality and Support of the Industry Leader

RamFactor is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

Features:

- Up to 16 MEG total memory, 256K to 1 MEG on main board. Up to 16 MEG with additional memory on piggyback card.
- Fully Apple II Memory Expansion compatible
- Compatible with Apple IIe, II+, IIGS, Franklin and Laser 128
- Battery back-up option allows you to turn on your Apple and run your favorite programs in less than 1 second!
- Automatically recognized by ProDos, DOS 3.3, Pascal and standard CP/M
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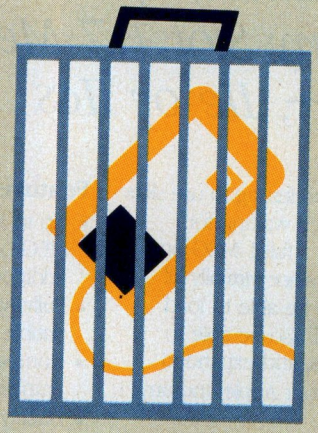
NewsPlus

MOVING MICE

Many moons after Apple introduced its AppleMouse, the company is formally urging its dealers to include mice in their standard demonstration setups. Not only that, but Apple is also encouraging dealers to show off Apple systems using two 3.5-inch-disk drives (more than a year after Apple brought out this size of drive). These suggestions to dealers may quell some complaints Apple receives for introducing technical advancements and then seeming to pay lip service to them rather than actively market them. This



ambivalence has been a problem for software developers who have jumped on the mouse or 3.5-inch-drive bandwagon at Apple's urging—only to find that not enough consumers were buying these peripherals. Now if Apple would only bundle a mouse with the Apple IIe and IIc as it does with the Macintosh and the IIGS . . . .

EXTENDED LIFE FOR MOUSEWORD

If Apple had thrown its full weight behind the mouse for the Apple II a while ago, perhaps International Solutions, Inc., could have done better. This California company, which went out of business last year, sold only mouse-based software (MouseWord, MouseCalc, and so on) and griped that Apple didn't promote the mouse as it should have. Of course, that's all water under the bridge now—although ISI's departure from the scene does leave its former customers high and dry when it comes to ongoing product support and updates.

Enter Roger Wagner Publishing, Inc., another purveyor of mouse-driven software, namely the word processor, MouseWrite. The Southern California company recently announced an upgrade path for users of ISI's MouseWord. For $75, owners of this word processing program can turn in their packages and receive a current version of Roger Wagner's MouseWrite.

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Almost every bit of music software you could possibly want or need can now be found in a unique single source: Coda, the bible of music software.

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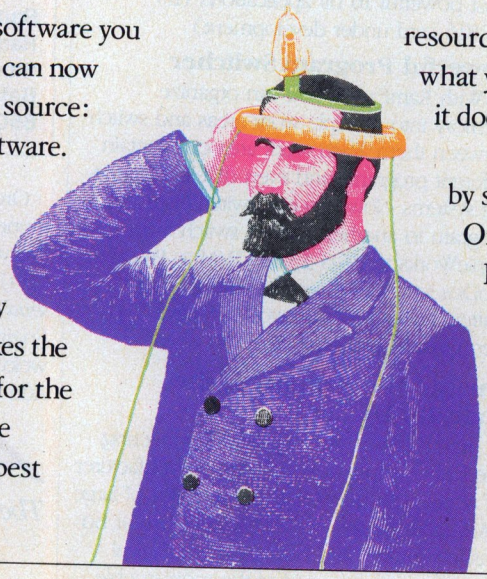

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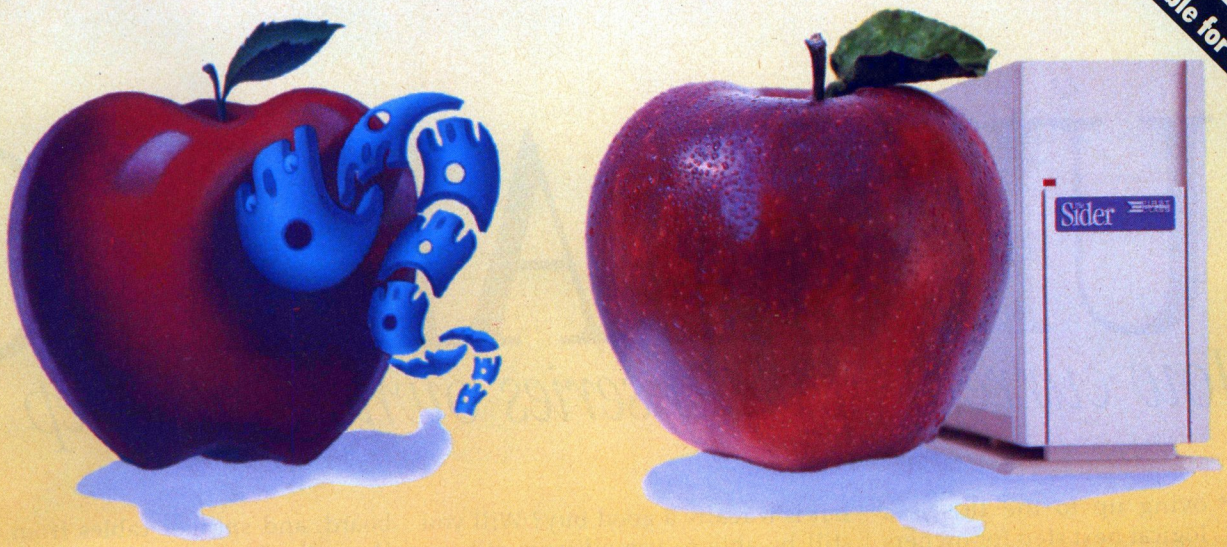

SIDER MAKES A GREAT APPLE PERFECT

First Class Peripherals introduces the first external 10-megabyte hard disk drive that is fully compatible with your Apple IIGS , II+ or IIe.

Sider is the Core of Your Apple's Production

Our Special Second Anniversary offer of **$499** is the affordable solution you've been waiting for. Operating your Apple® IIGS, II+ or IIe can become cumbersome when you have to continuously shuffle and store floppies. First Class Peripherals has a solution to the "floppy shuffle"... the Sider.

Sider, a 10-megabyte subsystem, is an economic business tool that allows you to save time and money with a bootable hard disk that is reliable, fast and affordable.

The field-proven Sider was introduced in 1984. First Class Peripherals worked closely with Xebec to produce a quality hard disk that works with all major operating systems—DOS®, ProDOS®, CP/M® and Pascal®—and is interactive from one system to another. The Sider's hard disk has an access rate many times faster than that of a floppy disk, and the storage on the 10-megabyte hard disk drive is equivalent to 72 floppy disks... and that's a lot of floppies to shuffle.

The Sider offers expandability. Its hard disk drive is partitionable, allowing you to allocate up to four operating systems on the same disk. And you can daisy-chain any two Sider products for a maximum of 40-megabytes of storage.

No Matter How You Slice It... It's a Sweet Deal.

You may ask yourself how First Class Peripherals can offer a 10-megabyte drive for only **$499.** The answer is simple. This second anniversary price is possible through innovative technology, high capacity on-shore manufacturing and factory direct sales methods. By selling through direct mail, dealer and distribution expenses are avoided, so you pay only for the product and its components... nothing more.

In addition to its great price, the Sider also comes with Siderware—installation and support utilities, host adapter card, all necessary cables and a reassuring 15 day money-back guarantee. Simply order the Sider and use it for 15 days. If you're not completely satisfied, return it for a full refund. If you choose to keep the unit (we're sure you'll love it), you also receive First Class Peripheral's one year limited warranty.

So Make Your Apple Perfect and Order a Sider Today!

To receive your 10-megabyte Sider for only **$499,** your 20-megabyte Sider II for **$799** or your B-Sider tape drive for **$695,** simply order using the coupon below, or for faster service order by phone and charge to your VISA, MasterCard or American Express. **Call Toll Free: 1-800-538-1307, Extension 23.**

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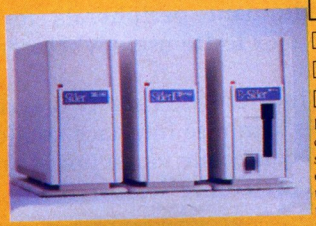

☐ **Yes,** please send me the items indicated:

☐ 10-Megabyte Sider @ **$499**

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UPGRADING

How current Apple II-series owners can step up

Moving up to the IIGS is a logical next step for owners of current Apple-II-series computers: You get a souped-up, Macintosh-like computer that still works with most of your current software and peripherals. If you own an Apple IIe, it's pretty obvious how you can upgrade to a IIGS—by purchasing an upgrade kit from Apple that gives your old IIe new innards. But that's only one approach to upgrading. Even if you have a IIc or a II Plus, there is still an upgrade path for you. You can sell (or set aside) your old CPU, buy a IIGS system unit, and use it with your old software and peripherals.

Here we examine the whys and wherefores of purchasing the official Apple upgrade kit and describe what you can and can't take along with you no matter which upgrade path you take and no matter which Apple II you're starting with.

The Apple IIGS upgrade kit, scheduled for release later this year, will give the almost two million IIe users the opportunity to transform their computers into IIGS equivalents for only $499. The upgrade is not available to II, II Plus, or IIc owners, however, despite frequent rumors to the contrary. It simply won't work with these computers because of lack of space inside the computer (IIc) or incompatible keyboards (II and II Plus).

The upgrade is only half the price of a real IIGS (the IIGS system unit, keyboard, and mouse cost $999). And, if you purchased a IIe from an authorized Apple dealer between July 15 and September 14, 1986, you can get a $100 rebate for an upgrade. But is it really a good buy? Will you still be able to use all your old peripheral cards and software? Should you keep your IIe and ignore the IIGS? Or is this the time to sell your IIe, II Plus, or IIc system unit and graduate to a genuine IIGS? These are some of the questions I hope you'll be able to answer after reading this article.

Details of the Upgrade

The IIGS upgrade kit consists of three items: a IIGS motherboard, a metal base pan, and a manual that describes the differences between a IIGS and a IIe. The upgrade does not include a IIGS keyboard, power supply, or case—you must salvage these items from your IIe. The upgrade also does not include the IIGS mouse or a disk drive.

The kit's motherboard is identical to the IIGS motherboard except that it has two additional connectors: one for the IIe keyboard and one for the optional IIe keypad. A new base pan (which includes the back panel) is needed because the IIe base pan does not have openings for the IIGS's built-in port connectors.

According to Apple, the upgrade kit must be installed by an authorized Apple dealer, but the $499 price does not include installation charges. Installation doesn't take long, however, so these charges should be low—some dealers may even do it free. Unfortunately, you are not allowed to keep your IIe motherboard; dealers must ship these back to Apple.

Installation is relatively simple and involves the following steps:

- disconnect the power supply, keyboard, and speaker cables from the IIe motherboard
- remove the base pan from the plastic casing of the IIe and save the speaker
- insert the IIGS motherboard and the new base pan
- reconnect the power supply, keyboard, and speaker cables.

The computer you end up with is functionally no different from a real IIGS—it just has a different keyboard and a different case. Thus, you will be able to take advantage of all the IIGS-specific software that will begin to appear in 1987, notably graphics and sound applications. One caveat: Most of this new software will probably require a mouse and 3.5-inch disk drives, but these are not part of the upgrade kit. You might need to budget a few hundred dollars more for these items.

Hardware Compatibility

A major factor in deciding whether to buy the IIGS upgrade is whether you can protect your existing investment in peripheral hardware. In other words, will all those nifty interface cards you've grown to know and love still work on the Apple IIGS?

Keep in mind that the IIGS has several built-in I/O ports, so you won't even need some of your old cards in the first place. That's nice because you can conceivably recoup part of the upgrade price by selling your redundant peripherals to II Plus users or to IIe users who aren't upgrading.

Built into the IIGS are two serial interfaces, a mouse interface, analog RGB and composite video ports, and a SmartPort controller for 3.5-inch

PHOTOGRAPHY BY CARTER DOW

TO THE IIGS

to the power of the IIGS

and 5¼-inch disk drives. The GS also has an internal battery-operated clock, a music/speech synthesizer, and 80-column-display circuitry. It seems pointless, therefore, to use cards that simply duplicate these functions.

You may want to continue using an interface card instead of the corresponding port, however, if the firmware on the card lets you issue useful commands that the IIGS does not. For example, some printer-interface cards, such as the Serial Grappler and Alphabits, contain advanced screen-printing utilities. And most clock cards give you the time and date in a variety of formats if you use a few simple Applesoft commands, unlike the IIGS clock.

You may also want to use a card instead of a port to avoid the expense of (or the hassle of making) a new cable for a printer or modem you already use. It's quite astounding, but it seems that every time Apple releases a new computer, it dreams up a new I/O connector. The serial connectors on the IIGS are 8-pin circular connectors, not the ones used on the IIc or on any peripheral card I've seen for the IIe or II Plus. These connectors are used on the Macintosh Plus, however.

Most (but not all) Apple II peripheral cards that plug into an I/O slot (not the IIe auxiliary connector) can work on the IIGS. The cards that definitely cannot work are multifunction cards that use "phantom" slot techniques (where an I/O de-

vice appears to be in a slot different from the slot in which the card is inserted), such as the Street Business-Card, AST Multi-I/O, and the Prometheus Versacard. These types of cards simply can't cope with the 16-megabyte address range of the 65816 microprocessor of the IIGS. Multifunction cards that don't use phantom slots, notably the RC Systems Slotbuster, can work.

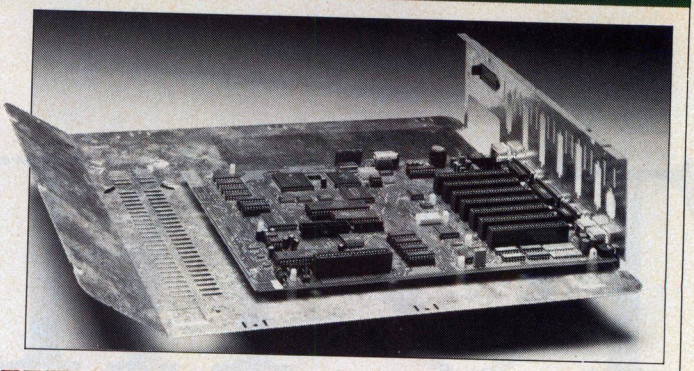
Generally speaking, single-function cards work fine on the IIGS—the list includes serial and parallel printer-interface cards, internal-modem cards, disk-drive controllers, and memory cards compatible with the Apple II Memory Expansion Card (such as the Applied Engineering RamFactor and the AST Sprint-Disk). There are exceptions, so you should ask the manufacturer of any given card whether it will work, before you upgrade.

Apple recommends using a fan if you install more than two expansion cards in the IIGS, to avoid heat-related damage to components. Apple sells an internal IIGS System Fan, but it won't fit inside an upgraded IIe case—use something such as the Kensington System Saver instead.

Two important exceptions relate to drive controllers. The interface card for the Apple ProFile hard-disk drive doesn't work properly on the IIGS—in fact, if you tried to use it, you could lose data. Apple has published a simple hardware fix to solve this problem, however. Older versions of Central Point Software's Universal Disk Controller won't work either, but, again, Central Point will make you a simple fix for a small charge. Eight-bit accelerator cards don't work on the IIGS at all, which causes no problems, because the IIGS already operates up to 2.8 times faster than does a standard IIe. (Note: Applied Engineering is working on a 16-bit accelerator designed to increase the speed of the IIGS.)

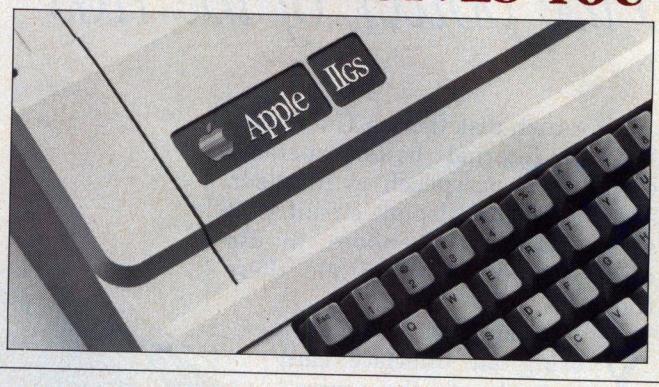
Any card designed for the auxiliary connector on the IIe definitely cannot work on the IIGS, because the IIGS has no auxiliary connector. So you can say good-bye to 80-column/memory cards such as MultiRAM and RamWorks. Many people also buy RGB video adapters for these cards that drive digital RGB color monitors. Unfortunately, the IIGS generates analog RGB signals, so you can't connect a digital monitor to the RGB port of the IIGS. (See "The IIGS Shows Its Colors," in this issue.) So say goodbye to your digital RGB monitor, too.

INSIDE:
The $499 Apple IIe-to-IIGS upgrade kit includes a metal base pan that has the new back panel and a IIGS motherboard. The kit's motherboard is identical to the IIGS motherboard except that the kit has the connectors for the IIe keyboard and IIe keypad.



WHAT THE UPGRADE GIVES YOU

OUTSIDE:
You will get an Apple IIGS logo to stick on your IIe, and a manual that describes the differences between a IIGS and a IIe.



BUT HOW MUCH WILL IT REALLY COST YOU?

FOUR SCENARIOS

No matter which old Apple you own, there's a way to carry over some of your previous investment (in terms of peripherals and software) to a IIGS. If you own a IIe, you can upgrade by swapping out the motherboard. Or, with the II Plus, IIe, or IIc, you can set aside or sell your old system and plug in a new IIGS box in its place—amid your old disk drives, modems, printers, and such.

But, (and this is a formidable *but*), if you want to step up to the GS, chances are you'll also want to buy the peripherals that allow you to take advantage of the fanciest features of this system. To use GS-specific software, you'll need 3.5-inch disk drives, and to appreciate all those beautiful graphics, you'll probably want an analog RGB monitor. Here's a snapshot look at four sample situations—and their approximate costs—in which an Apple owner upgrades or sells an old system in order to move up to the GS.

SCENARIO #1

Approximate cost: *$500*

John is an Apple IIe owner who takes the simplest route: He buys the upgrade kit from Apple and continues to use the printer, modem, 5¼-inch disk drives, software, and composite monitor he already has.

Software Compatibility

Apple has made a concerted effort to make the IIGS compatible with existing IIe software. As a result, almost all Apple IIe software works with it without modification, including such standards as AppleWorks, Apple Writer, MouseWrite, The Print Shop, and Pinpoint.

A few programs cannot work on the IIGS at all, however. The biggest culprits are communications programs that bypass the serial-port firmware and communicate directly with the port's hardware registers. Many such programs understand only the 6551 chip of the Super Serial Card, but the IIGS uses the Intel 8530 chip. (This is the same chip the Macintosh uses; Apple used it to permit the IIGS to connect easily to AppleTalk networks.) Point-to-Point was designed to work with the IIGS. Others, such as ASCII Express and CommWorks, were upgraded after the announcement of the IIGS last September. Contact the publisher of your software for upgrading information if you have an old version.

Some software may work on the IIGS but only at normal speed (1 MHz). This category includes any software that relies on precise timing loops, primarily music software and some games. You can use the IIGS Control Panel desk accessory to switch from the fast speed (the IIGS default) to normal speed.

Programs that use the cassette port on the IIe won't work on the IIGS because the IIGS has no cassette port. Few users will lose sleep over this restriction because programs that require such a port are rare.

Apple has distributed a software compatibility chart to dealers, but I wouldn't rely on it too much. It's just too difficult to keep accurate track of so many versions of so many programs. If you really want to be sure your program works, sit down in a dealer's showroom and try your software on a IIGS. You should also contact the software publisher to verify compatibility and inquire about special IIGS versions. All major publishers are taking prompt steps to make their programs work on the IIGS if they don't already.

All major publishers are taking prompt steps to make their programs work on the IIGS if they don't already.

For some users, an attractive alternative to buying the IIGS upgrade kit is to buy a real IIGS and keep the old Apple II or sell it. The extra cost for IIe owners is only $500, but it's even less if you consider that you have to pay for the upgrade kit, installation, a mouse, and a numeric keypad to get the equivalent of a $999 IIGS. And just think how happy the kids will be when you give them your spare computer or how happy you will be if you can sell the old Apple for more than the cost of an upgrade kit! But remember, the longer you wait, the harder it will be to sell your old system, so move quickly. Just ask people still using the II Plus whether they wish they had moved up to the IIe four years ago.

If you take this route, the only extras you really need to have before firing up the IIGS are a video monitor and a disk drive (preferably a 3.5-inch drive). You can purchase composite black-and-white monitors for less than $100 (or you can splurge and spend $499 on Apple's RGB monitor); Apple's 3.5-inch disk drive will cost you $399, but you can probably find other drives for less. External peripherals you might already have—such as modems and serial printers (for example, the ImageWriter)—work with both old Apple II-series computers and the IIGS. All you have to do is invest in another set of cables. If you have a parallel printer, you'll have to buy a parallel-interface card for the IIGS.

Decision Time

I'm convinced that if you own an 8-bit Apple II and you're not using a lot of oddball software or hardware that won't work on the IIGS, you should move up to a IIGS, either by purchasing the IIe upgrade or buying the IIGS itself. It's just too good a deal to turn down. ✚

Gary Little is the author of Point-to-Point, a communications program for the IIe, IIc, and IIGS published by Pinpoint Publishing.

However, if he later wants to use the more powerful GS software, he'll need to spend another $500 or so to buy a 3.5-inch drive and a mouse.

SCENARIO #2

Approximate cost: *$650*

David has an Apple IIe with 128K of memory, two 5¼-inch disk drives, a composite monitor, hard-disk drive, printer, multifunction card, and modem. For $750, he sells the system with its additional memory, one of the drives with the controller card (he keeps one to run his old software on the GS), and the multifunction card (since it won't work on the new system). The rest of the peripherals he keeps to use with the GS, and he also buys a 3.5-inch drive so that he can take advantage of the new software. The suggested price for the IIGS (which includes a mouse) plus disk drive is $1398, so with the amount David receives for his old system, his net out-of-pocket expense is $648.

SCENARIO #3

Approximate cost: *$900*

Elizabeth owns an Apple IIc with a composite monitor, second disk drive, printer, and modem. She sells the system unit with its built-in drive for $500 and keeps all her other peripherals to use with the GS. Besides buying the IIGS system, she also buys a 3.5-inch drive, for $1398. Subtracting the $500 she gets from selling her IIc, her total outlay is $898.

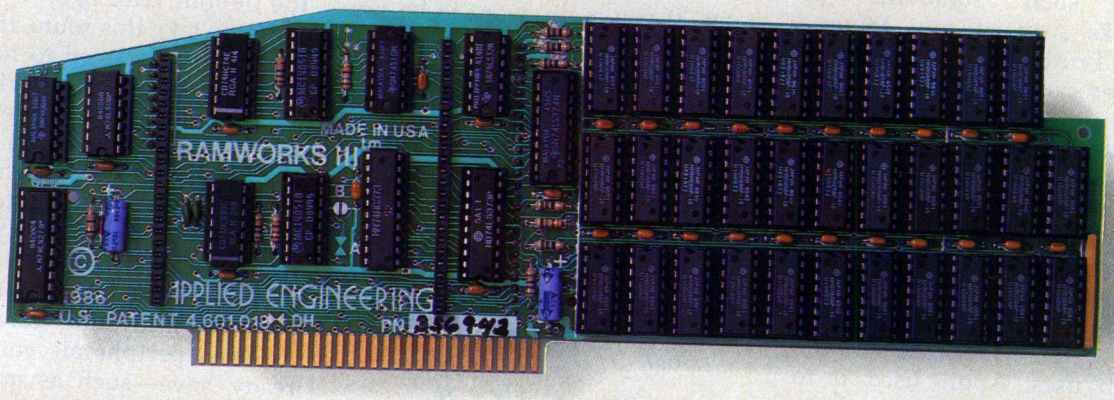
SCENARIO #4

Approximate cost: *$1150*

Ron has an Apple II Plus with two 5¼-inch drives, printer, modem, monochrome monitor, hard-disk drive, accelerator board, and multifunction card. He sells the system unit, one drive, the monitor, and enhancement cards for $750 and then buys a GS with 3.5-inch drive and RGB monitor for the suggested price of $1897—his net cost is $1147.

RamWorks® III

Patented Performance from the Recognized Leader



With battery backed RAM port, RGB port, increased memory capacity, full software compatibility and more compact design, RamWorks III is a generation ahead.

RamWorks III is the newest 3rd generation RAM card for the Apple IIe. It incorporates all of the technology and improvements that years of experience and over a hundred thousand sales have given us. By selling more memory cards than anyone else and listening to our customers, we were able to design a memory card that has the ultimate in performance, quality, compatibility and ease of use. A design so advanced it's patented. We call it RamWorks III, you'll call it awesome!

The AppleWorks Amplifier.

While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

Only RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, Catalyst, MouseDesk, Howard-Soft, FlashCalc, Pro-Filer, Managing Your Money, SuperCalc 3a, and MagiCalc to name a few (and *all* hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxiliary slot providing our super sharp 80 column text (U.S. Patent #4601081) in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

Highest Memory Expansion.

Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 meg is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for up to 20 years.

It Even Corrects Mistakes.

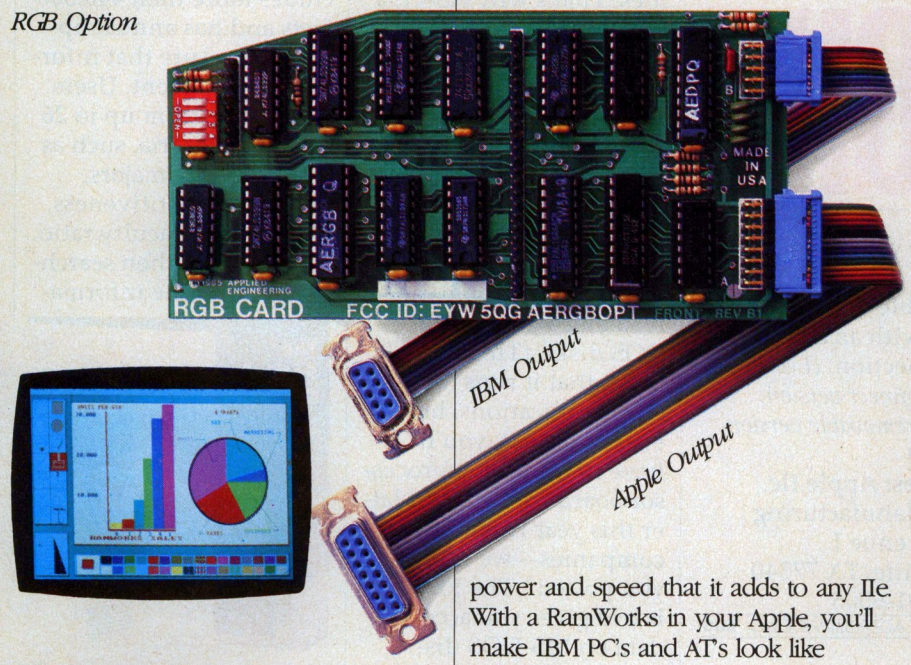
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

The Ultimate in RGB Color.

RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

RGB Option

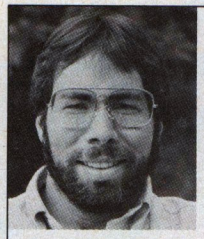


True 65C816 16 Bit Power.

RamWorks III has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 meg of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 yet maintains full 8 bit compatibility.

Endorsed by the Experts.

A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."



"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak, the creator of Apple Computer

Apple experts everywhere are impressed by RamWorks's expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

Quality and Support of the Industry Leader

RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

It's Got It All

- 15 day money back guarantee
- 5 year hassle free warranty
- Built-in super sharp 80 column display, (U.S. Patent #4601081)
- Expandable to 1 MEG on main card
- Expandable to 16 meg with expander cards, with NO slot 1 interference
- Can use 64K or 256K RAMs
- Powerful linear addressing 16 bit coprocessor port
- Automatic AppleWorks expansion up to 3017K desktop
- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- The only large RAM card that's 100% compatible with all IIe software
- RamDrive™ the ultimate disk emulation software included free
- Memory is easily partitioned allowing many programs in memory at once
- Compatible, RGB option featuring ultra high resolution color graphics and multiple text colors, with cables for both Apple and IBM type monitors
- Built-in self diagnostics software
- Lowest power consumption (U.S. Patent #4601081)
- Takes only one slot (auxiliary) even when fully expanded
- Socketed and user upgradeable
- Software industry standard
- Advanced Computer Aided Design
- Used by Apple Computer, Steve Wozniak and virtually all software companies
- Displays date and time on the AppleWorks screen with any PRO-DOS compatible clock
- Much, much more!

RamWorks III with 64K	**$179**
RamWorks III with 256K	**$219**
RamWorks III with 512K	**$269**
RamWorks III with 1 MEG	**$369**
RamWorks III with 1.5 MEG	**$539**
RamWorks III with 2 to 16 MEG	**CALL**
65C816 16 Bit Card	**$159**
RGB Option	**$129**
Optional Software:	
Pinpoint with RAM Enhancement Software	**$79**
VIP Professional	**$219**

RamWorks III. The industry standard for memory expansion of the Apple IIe. ORDER YOUR RamWorks III TODAY. See your dealer or call (214) 241-6060, 9 a.m. to 11 p.m., 7 days, or send check or money order to Applied Engineering.

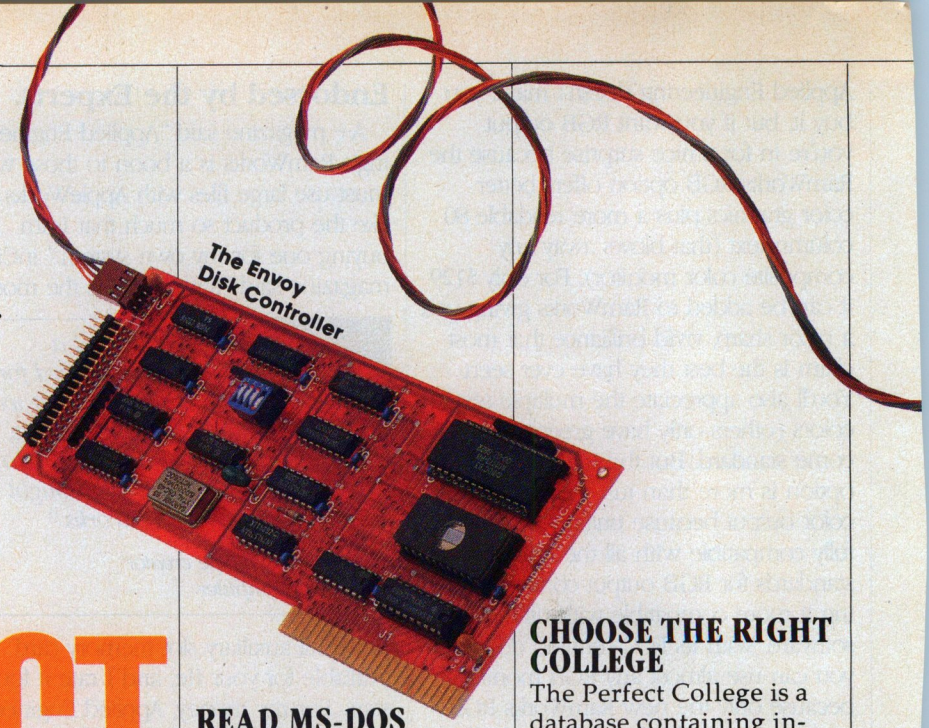
MasterCard, Visa and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 if outside U.S.A.

Applied Engineering™

P.O. Box 798, Carrollton, TX 75006
(214) 241-6060

A compendium of interesting products for the Apple II family

PRODUCT SPOTLIGHT



ATTENTION IIc NUMBER CRUNCHERS

Designed for use with any spreadsheet or database program, the Apple IIc Numeric Keypad provides the numbers 1–10; a minus (−) key; and enter/plus (+) key; right-, left-, and down-arrow keys; and a tab key. Two versions of the keypad are available—a direct-connect version for permanent use and a removable version that comes with an adapter for disconnection. *(List Price: direct-connect version, $99.95; removable version, $119.95)*

Requires: Apple IIc

C&M Manufacturing
2400 Avenue I
Huntsville, TX 77340
(409) 291-6005

CIRCLE READER SERVICE NO. **505**

READ MS-DOS DISKETTES

It takes a special kind of diplomacy to get Apple II systems to read MS-DOS files. That's why ASKY, a San Jose, California, firm has brought out the Envoy board, a disk controller that plugs into your Apple (any Apple II—except the Apple IIc—running ProDOS or DOS 3.3) and connects it with an MS-DOS drive. Thus connected, your Apple can read and write to MS-DOS disks. (This doesn't mean that it runs MS-DOS applications, however—for that, you'll have to wait for coprocessor boards coming out later this year from other companies—we'll keep you posted.) The Envoy board gives you access to data on MS-DOS diskettes, and the company is working on data conversion utilities that will work with programs such as AppleWorks and Lotus 1-2-3. *(List Price: $180)*

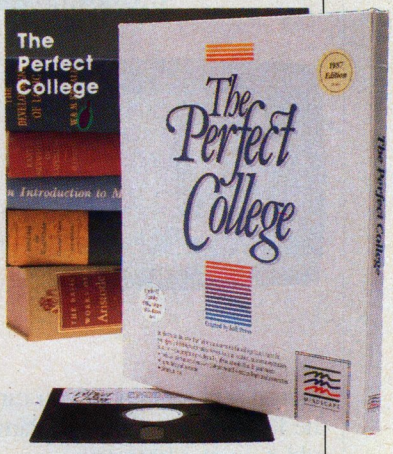
Requires: Apple II Plus, IIe, or IIGS; ProDOS or DOS 3.3

ASKY, Inc.
4320 Stevens Creek Blvd.
Suite 287
San Jose, CA 95129
(408) 247-5742

CIRCLE READER SERVICE NO. **506**

CHOOSE THE RIGHT COLLEGE

The Perfect College is a database containing information about more than 1650 accredited four-year U.S. colleges and universities. It includes more than 440,000 facts and has annual updates to ensure that information is current. Users can choose from up to 26 selection criteria, such as cost, location, majors, overall competitiveness, and student/faculty ratio. The program then searches and sorts the information and produces a list of schools that match the chosen criteria. *(List Price: $19.95; free with Mindscape's The Perfect Score)*



Requires: Apple IIe or IIc

Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667

CIRCLE READER SERVICE NO. **507**

TALK TO YOUR APPLE

Covox's Voice Master systems now include a speech-editing program that lets you edit the amplitudes of digitized speech. Voice Master produces digitized speech and music output and can recognize groups of words and phrases.

Also available is the Speech Construction Set, a full-featured speech editor that includes the amplitude editor as a subset. The set features advanced editing commands and lets you cut and paste voice patterns to create high-quality, natural-sounding speech for use in your own programs. No extra hardware is required for playback.

For the Apple II Plus and IIe, Covox has also released the Sound Master card, which provides enhanced speech quality and music capabilities. The card includes software that adds new BASIC commands and provides independent tone and noise channels and programmable envelope shapes. *(List Price: Voice Master, $89.95; Speech Construction Set, $49.95; Sound Master, $39.95)*

Requires: Apple II Plus or IIe, 64K RAM, Voice Master

Covox, Inc.
675-D Conger Street
Eugene, OR 97402
(503) 342-1271

CIRCLE READER SERVICE NO. **508**

The Voice Master speech and music program from Covox

Roland's S-10 Keyboard Sampler

TYPE!

Type! provides instruction in touch-typing for both novices and skilled typists, providing exercises containing real-world sentences and text. The program uses diagnostic drills to analyze users' performance and recommends the best exercises for improving specific weaknesses. It also displays detailed graphs of users' performance, recommends customized exercises to increase speed and accuracy, saves daily results, and prints progress reports. In addition, the program contains Type-Athlon!, an arcade-style game that features different levels of exercises and diagnostics. *(List Price: $44.95)*

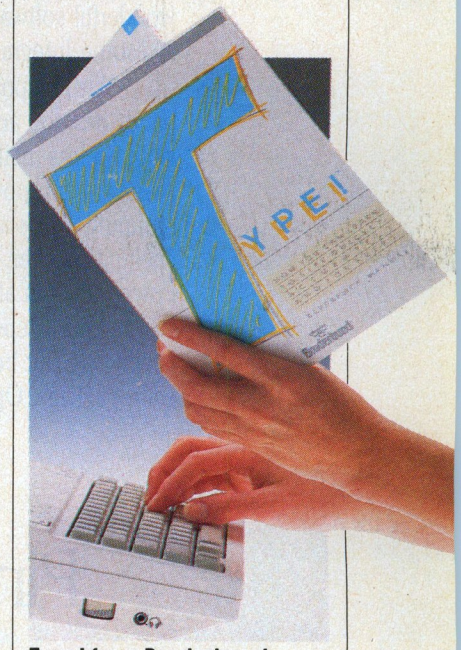
Requires: Apple II Plus, IIe, or IIc; 64K RAM

Brøderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903-2101
(415) 479-1700

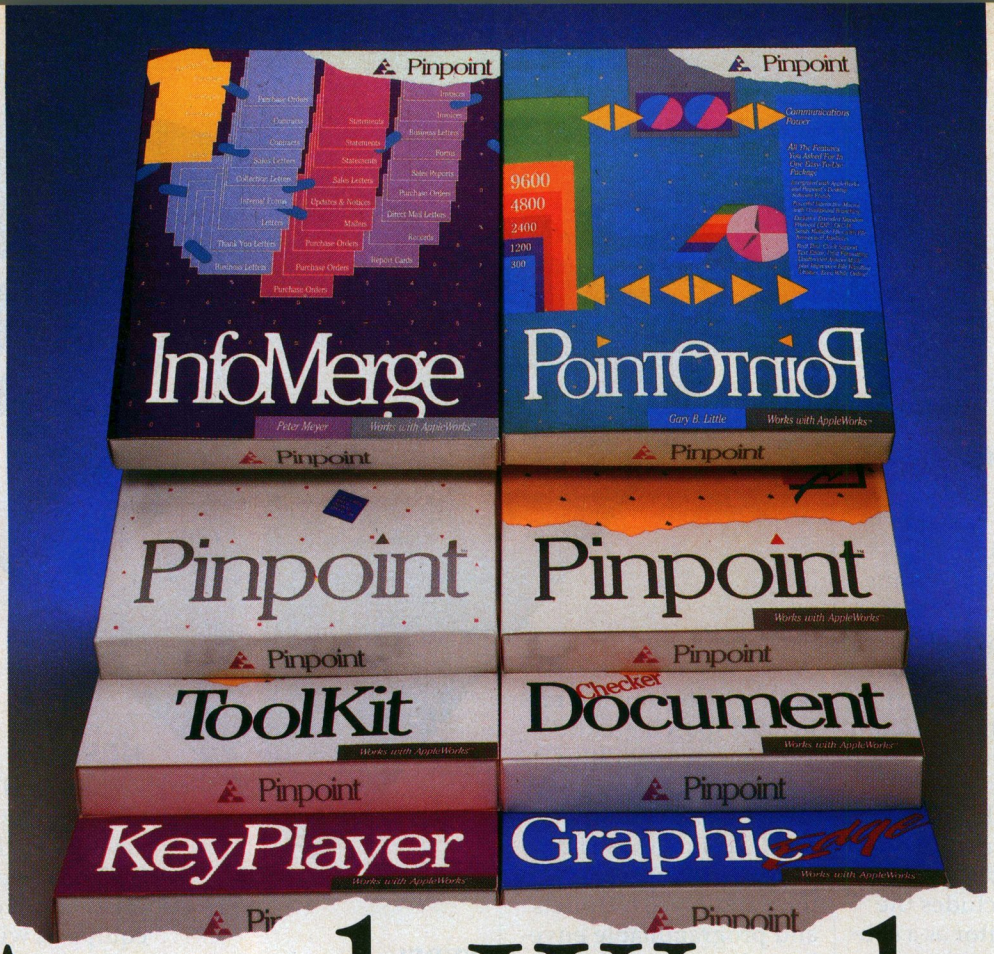
CIRCLE READER SERVICE NO. **509**

MUSICAL MARVELS

Roland has introduced two new digital sampling keyboards, the S-50 and S-10, that work with Apple II-series computers equipped with a MIDI interface. Both of these keyboards work with digitized sound samples that sound like real instruments. Both also let you record and edit your own sounds for playback. The S-50 has 512K RAM, a built-in, 3.5-inch disk drive, an on-board 32-character display, and a variety of output jacks.



Type! from Broderbund



AppleWorks™

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Transform AppleWorks from a simply wonderful software program, into an awesome integrated workplace.

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What keeps Pinpoint Publishing ahead is what we put behind every software package. Open-architecture design with great growth potential built in.

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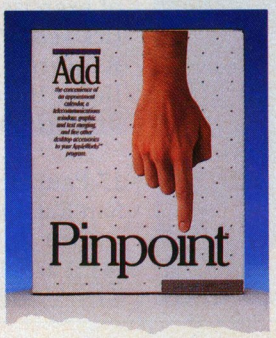
▲ You can pick-up Pinpoint's Power Tools from dealers who carry Apple software. For the name of the dealer nearest you, or to request our Product Information Packet, you can call our 24 hour Toll Free number. 800-633-2252 Ext. 620. Give us a try and you'll quickly see the care that goes into everything we do.

Pinpoint™



Pinpoint Publishing
P.O. Box 13323
Oakland, CA 94661-0323
(415) 654-3050

CIRCLE 239 ON READER SERVICE CARD

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PRODUCT SPOTLIGHT

Users can assign the keyboard to Dual or Split modes and can play 16 different sounds simultaneously.

The S-10 features the same sound-generation design as does the S-50 but in an eight-voice, four-octave configuration. The S-10 keyboard also offers Dual and Split modes, but only allows you to access four samples simultaneously.

Also available are professionally sampled sounds from Roland's Sound Bank program. All purchasers of an S-50 or S-10 receive a membership card entitling them to free sounds. Owners also receive a free quarterly magazine that contains lists of new sound offerings.

Although either keyboard can be used as a stand-alone device for playing live music, you can greatly expand the capabilities of the keyboards by using a MIDI-equipped Apple II-series computer as a sequencer to store, edit, and play back compositions. *(List Price: S-50, $2,995; S-10, $1,495; MIF-APL MIDI interface board, $150; MPU-401 MIDI controller box, $275; MUSE sequencing software, $150)*

Requires: Apple IIe or IIGS; MIDI interface

RolandCorp US
7200 Dominion Circle
Los Angeles, CA 90040
(213) 685-5141

CIRCLE READER SERVICE NO. **510**

MORE PICTURES FOR PRINT SHOP

Epyx has introduced the first two chapters of the Graphics Scrapbook, a series of specialized graphics disks compatible with The Print Shop and PrintMaster. Each disk contains more than 100 images. Chapter 1: Sports provides an assortment of sports graphics including football, basketball, hockey, bowling, gymnastics, swimming, martial arts, aerobics, and more. It also contains art for trophies and mascots for use in fliers, posters, newsletters, and invitations. Chapter II: Off the Wall features zany, funny, offbeat, and weird graphics—flamingos and punk teddy bears, high-tech and no-tech, bizarre animals, body parts, jesters, and international symbols. *(List Price: $39.95 each)*

Requires: Apple II Plus, IIe, or IIc

Epyx, Inc.
600 Galveston Drive
P.O. Box 8020
Redwood City, CA 94063
(415) 366-0606

CIRCLE READER SERVICE NO. **511**

PROTECT YOUR APPLE

The PS Series is a custom, flexibly designed physical security system.

Cool Stack Sentry II offers locking, cooling, easy tilt-action access, and efficient storage and organization in one compact unit for Apple II-series computers.

Printer Pal, which secures a printer to its stand, comes in three standard models with different dimensions to suit most popular printers.

The Cavalier Series is a dual-plate locking system that secures equipment, using existing pre-

The PS Series security system

punched holes or using special adapter plates, which come in three standard sizes. In this series, CAV IIc secures the Apple IIc computer, monitor, external disk, and power supply. *(List Price: Cool Stack Sentry II, $194; Printer Pal, $34; CAV IIc, $115)*

Requires: Apple II Plus, IIe, IIc, III, or IIGS

Secom General Corp.
26111 Evergreen
Suite 300
Southfield, MI 48076
(313) 354-3073

CIRCLE READER SERVICE NO. **512**

GRAPHICS TOOL KIT

The Graphics Tool Kit consists of a board that stores complete drawings in memory and a graphics-design software package. The hardware displays the complete width and half the height of an 8½ × 11-inch drawing on any one of eight 640 × 384-pixel high-resolution screens. The board also contains an Apple-compatible mouse port. Features of the software package include automatic windowing and the ability to work on two 8½ × 11-inch pages simultaneously. It also contains fonts, sample pictures, and clip art. *(List Price: $395)*

Requires: Apple II Plus, IIe, or IIGS

Demco Electronics
10516 Grevillea Avenue
Inglewood, CA 90304
(213) 677-0801

CIRCLE READER SERVICE NO. **513**

The Graphics Tool Kit

INTRODUCING TYPE!™

Now you can learn to type quickly, accurately and for keeps.

Learning to type is neither a game nor a drag, even though the leading learn-to-type programs treat it that way.

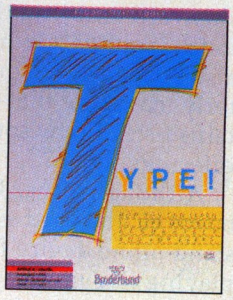
That is to say, the leading learn-to-type programs until now.

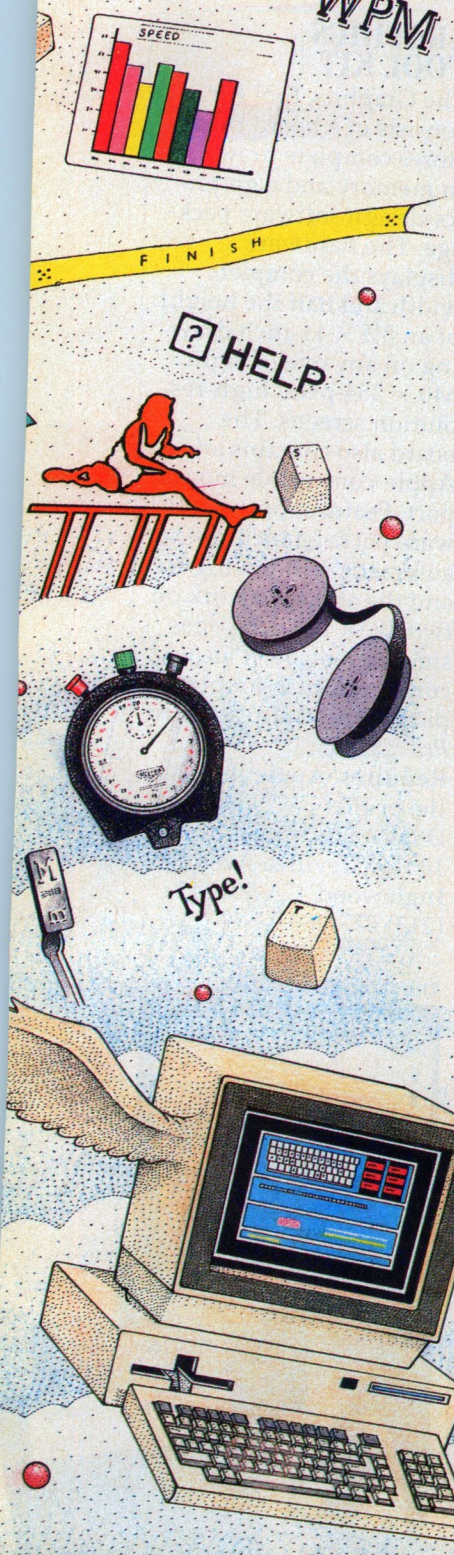
Because TYPE! is the first product to take full advantage of extensive research on how people learn to type, and combine that with the full potential of your computer.

The result? A learn-to-type program that is equally effective for business professionals and students, beginners and advanced typists.

Among other things, TYPE! combines advanced diagnostics and continuous monitoring, then customizes drills to your individual errors so that now you can learn to type quickly, accurately and for keeps.

And just because we're as serious as you are about learning to type doesn't mean we can't include a game. So we did.





Brøderbund®

You'll swear you got a new computer.

TYPE! is available for Apple II and IBM personal computers. Coming soon for Commodore 64/128.
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HISTORY, PART II *BY THOM HOGAN*

APPLE:
THE FIRST TEN YEARS

Technology has been one driving force in Apple's history, the people who inspired, innovated, or tamed the corporation have been another.

In January, Apple Computer, Inc., celebrated its tenth birthday and Apple co-founder Steve Wozniak reflected on the ten years in the pages of A+. In that issue, we also traced the history of Apple's computers and code names. In this month's second of two parts honoring Apple's first decade, we look at the people who made Apple so successful and present a ten-year timeline, and an Apple executive gives us a glimpse at the next ten years.

Technology has been one driving force in Apple's history; people have been another. The chaos generated by the dozens of revisions to basic Apple products probably would have put most firms out of business. The reason Apple hasn't succumbed to what personal-computer pioneer Adam Osborne likes to call hypergrowth, however, has to do with people. The two Steves, of course, have been appropriately labeled by the press as being the renegades, the creators of the Apple chaos. Both of them were always pushing at the very things that made the company successful. Steve Jobs, for instance, disrupted the company with his pirate's flag over the Macintosh building, basically pooh-poohing the Lisa at the same time that he, as CEO, was touting its technical elegance to the world. Woz, meanwhile, kept saying that the Apple II could be better, even as the company tried to shift resources first to the III, then to the Lisa, then to the Macintosh. Both Steves had their followers, and both made a lot of noise in support of their causes.

So how did the company survive? After all, with product infighting going on at the level it was at Apple, many companies would have performed about as well as a sailboat with no one at the tiller.

In the beginning it was people such as Mike Scott and Mike Markkula who stabilized Apple. Scott, who was Apple's president in the early days, was the only man who could yell loud enough to be heard over the noise the two Steves generated; Markkula, who has been chairman and president and is now Apple's vice chairman, was the quiet organizer. Both were good at attending to details, but others were instrumental as well.

The attitude inside Apple was typical of that of most Silicon Valley start-ups: If you think you can do it, give it a try. People were encouraged to do their best work. Chris Espinosa, at an age at which many people struggle to write book reports, helped turn out manuals that were understandable and fun. Randy Wigginton took software routines that Woz wrote, spruced them up, and added nifty details. Fred Hoar did a good job of explaining to the press what Apple was up to and defusing the controversial things that either of the two Steves might say in too-candid situations. And in the middle of it all, a few new geniuses were sprouting, simply because they got the opportunity to try.

Jef Raskin, for instance, wrote the original specifications of the machine that eventually became the Macintosh. If you talk to Raskin today, he'll tell you about "information appliances," and perhaps that's what the original Mac was supposed to be. No one can agree where he lost control of his concept, but even a short talk with Raskin will convince you that many of the underlying ideas behind the Macintosh were Raskin's and were amplified by Job's eventual opinionated leadership of the group.

The Lisa software, in which the Macintosh's has its roots, clearly shows the leadership of John Couch, a teddy bear of a man who, when excited by something, could get even the most blasé person enthused. With Couch coaching the Lisa software team, it kept improving its early ideas until they became Apple's and ceased being mere imitations of the Xerox Star software, from which many of the underlying concepts

(mice, windows, bit-mapped graphics) originated. Couch was so enthused about LisaProject, for example, that he insisted on the use of the early versions of this program to perform the project-management tasks for LisaProject! Yes, recursion works inside of computer companies as well as inside computer programs.

Some of the Lisa personnel made it into the Macintosh camp. Andy Hertzfeld, for example, who had been a Pascal programmer involved with both Apple Pascal and LisaPascal, became one of the key software programmers for the Macintosh.

In the Macintosh group, Jobs was the final authority, and, according to almost everyone who was there, he pushed his charges to their limits. He tested people by asking why they did things the way they did, just to make sure they had thought everything through. He told people they had created "junk" (actually, he used a stronger four-letter word) and that he knew that they could do better. Yet he still pretty much let people try to solve things the way they wanted to solve them. Jobs was interested only in the end result, not so much in how you got to it.

Most of these people are now out of Apple's day-to-day picture. Scott is gone. Markkula has moved into a background role. Hertzfeld is gone. Woz has left several times only to return again. After a power struggle with Sculley, Jobs left in September 1985 to start Next, Inc. Couch has moved to Southern California. In fact, it seems like everywhere you look within Apple, the key players who inspired, innovated, or tamed the original corporate animal just don't work there anymore.

In their place are new people, people such as John Sculley, Jean-Louis Gassée, Guy Kawasaki, and others. Sculley, after quietly organizing Apple for two years, has proven to be a direct replacement for both Markkula and Scott. Many subtle changes in the Apple hierarchy are the result of Sculley's methodical recruiting and rewarding, but Sculley can handle dramatic shifts as well. He brought the II and Macintosh groups together last year to create "one Apple," and after Apple's first quarterly financial loss, Sculley laid off 1200 workers. No one could doubt who was in charge, especially after Jobs left in a huff several months after losing control of the Mac group.

> Apple's basic philosophy has remained intact, despite the apparent migration of key people.

Gassée and Kawasaki are the new renegades in the Apple structure, pushing hardware and software, respectively. Gassée, like Jobs, seems to be driving his people hard, yet he still gives them the freedom to try it "their way" first. Kawasaki is more in the tradition of Woz, motivating by simply being eager and excited about every possibility—"no" is not an answer Kawasaki wants to hear.

Thus Apple's basic philosophy has remained intact, despite the apparent migration of key people from the company. Apple still balances excitement ("let's give it a try") in the ranks with a quiet determination to avoid chaos.

Yet, in some ways the original cast of characters is not gone. Woz is back as a cheerleader for the IIGS and even says that he's "staying up nights programming on the machine." Jobs invested in a company that produced a state-of-the-art Macintosh word-processing program and seems only to want to out-Apple Apple with his Next computer. Hertzfeld is still writing software and allowing Apple first crack at it, with the option to publish it himself if he thinks Apple doesn't do a good enough job.

To be sure, Apple is not quite the same company it once was, but one look at the firm shows you that it is continuing to do the same thing it has done over and over in its history: make its existing products better. The Macintosh, already released in five different versions, seems destined to come out in at least two others in the near future (the so-called open-Mac and flat-Mac versions). Indeed, if history repeats itself, Apple will freeze the basic Macintosh hardware and core software into a single chip or set of chips for the next round, with additional chips adding new functions to the basic product.

The ImageWriter and LaserWriter printers have already gone through two revisions apiece, and it appears that both of them will go through at least one more. The 20-megabyte hard-disk drive has seen two iterations in a year. The mouse has had at least three distinct versions.

So, in examining Apple's first ten years, we see the seeds for a successful second decade. No doubt there will be an Apple IV some day, and when it proves to be not quite what the marketplace needs, it will become the Apple IV Plus, or IV Enhanced, or 4.5, or some other name—the same basic machine with a new set of features. And when the base Apple IV machine is figured out, its design will be frozen in stone (actually silicon), and the basic features will remain the same, as Apple adds new and clever enhancements to keep the product up to date. Because that's the way the Apple bounces: up a little higher each time. ✚

Thom Hogan has owned five Apples in the last ten years and will probably own future Apples as well. Best known for his book The CP/M User Guide *(which accompanies the Microsoft SoftCard), he has also served as editor of* InfoWorld *and* Business Software *and as director of software at Osborne Computer. These days you can find him sitting beside the pool, busily writing with his laptop computer, which he wishes were an Apple. He lives in Cupertino, California.*

EVERY TIME I TRIED T
PRINT A SPREADSHEE
IT RAN RIGHT OFF TH

"Then I got new Sideways for the Apple II"

Now, you too can keep wide spreadsheets from meeting an untimely end at the edge of the printer paper. Use new Sideways® for the Apple II.™

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And it works with every spreadsheet and word processor we can think of, whether it runs with ProDOS® or DOS 3.3. Just flip open the manual to find step by step instructions for using Sideways with an extensive number of popular programs.

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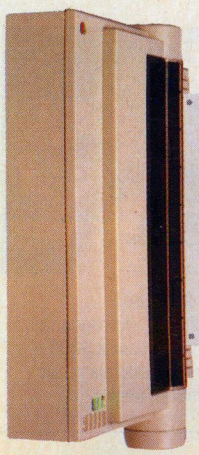

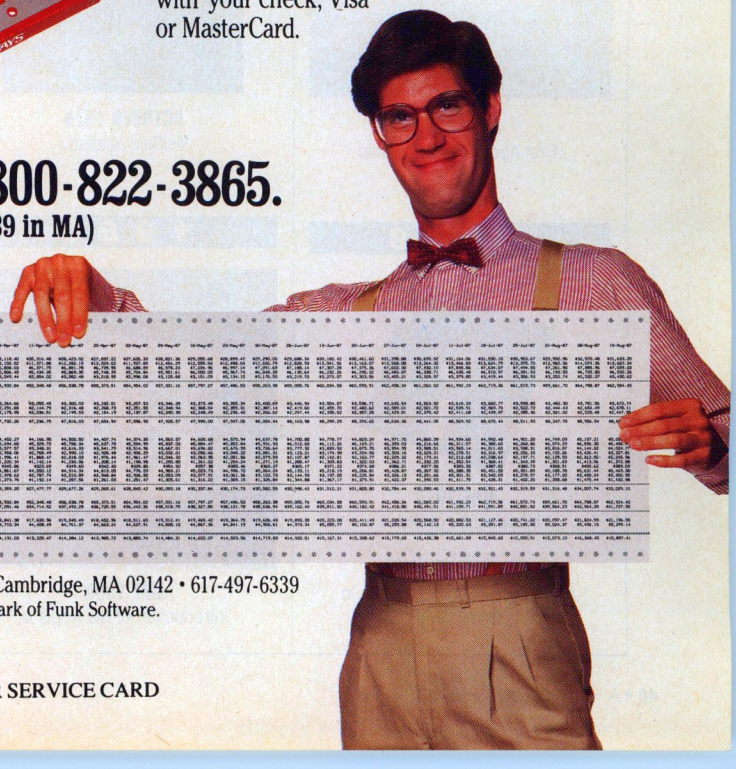

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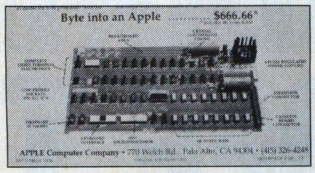
CIRCLE 154 ON READER SERVICE CARD

BACK IN TIME

Apple's ten-year

1976



JULY 1976
Jobs and Woz deliver first Apple I computers to computer stores

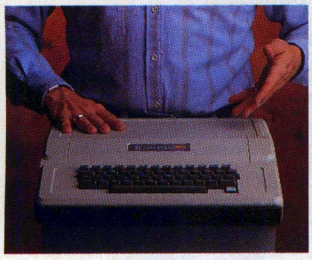
1977

JANUARY 1977
Apple incorporates

apple computer inc.

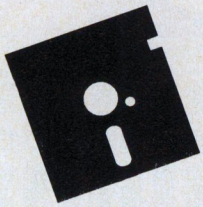
APRIL 1977
Apple II introduced at the first West Coast Computer Faire

MAY 1977
First Apple II boards ship



JUNE 1977
First Apple II systems ship

1978



JUNE 1978
Introduction of Disk II

SEPTEMBER 1978
Apple sells 7600 computers in fiscal 1978

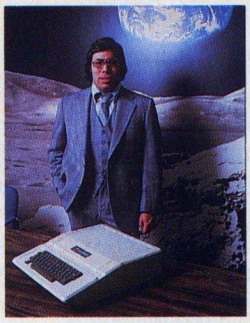
1979

JUNE 1979
Introduction of Apple II Plus

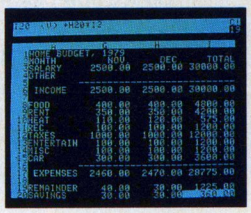
apple II plus

SEPTEMBER 1979
Apple sells 35,100 computers in fiscal 1979

Macintosh project formally begins



OCTOBER 1979
Woz receives Grace Murray Hopper Award for his work in personal computing



OCTOBER 1979
VisiCalc released

1980

MAY 1980
Introduction of the Apple III

MAY 1980
Apple rents Disneyland for a night during the National Computer Conference

SEPTEMBER 1980
Apple sells 78,100 computers in fiscal 1980

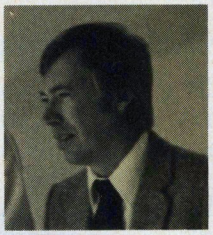
13	6⅛	Andros	Anlyz	..	19	33	8¾	8½	8¾+	¼
12½	3¾	Animed	Inc	..	..	105	4	3¾	4	+ ¼
20¾	12	Anitec	I s.30	1.8	9	2746	17¼	16½	16¾	...
15⅛	6⅝	ApogeeEn	s.12	1.5	13	475	8⅛	7⅞	8⅛	...
20¾	9⅛	Apollo	Comptr	..	85	1214	12¼	11⅞	11⅞	...
33⅛	15⅜	Apple	Bank	..	..	97	24½	24	24⅛+	⅜
39⅛	18⅞	Apple	Comptr	..	15	13236	35⅜	34⅞	35¼+	¼
55	27⅜	Appld	Biosyst	..	39	559	32¼	31½	31½−	¼
6½	2½	Applied	Data	..	..	1	3¼	3¼	3¼−	½
16⅜	8	Applied	Matl s	..	103	276	10¼	9¾	10¼+	½
14¼	8¼	Applied	Solar	..	..	5	11¼	11¼	11¼	...
5¾	1¾	Arabian	Shld	..	..	9	2½	2	2½	...
24½	14¾	Arbor	Drugs	..	19	901	18¾	18¼	18½+	¼

DECEMBER 1980
Apple's initial public stock offering

1981

FEBRUARY 1981
"Black Wednesday": 40 employees are laid off

Woz, injured in plane crash, begins a leave of absence



MARCH 1981
Apple reorganizes. Markkula becomes president and chief executive, replacing Mike Scott, who becomes vice chairman. Jobs becomes chairman of the board.

First million-dollar shipping day

JULY1981
Mike Scott leaves Apple

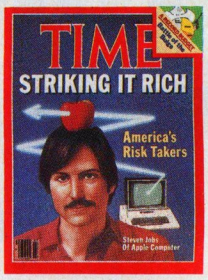
AUGUST 1981
IBM introduces its Personal Computer

SEPTEMBER 1981
Apple sells nearly 180,000 computers in fiscal 1981

NOVEMBER 1981
Introduction of ProFile, a five-megabyte hard-disk drive for the Apple III

DECEMBER 1981
Apple III reintroduced after solution of technical problems

1982



FEBRUARY 1982
Jobs appears on the cover of *Time* magazine

MARCH 1982
Apple announces it will take legal action against Asian clone makers

MAY 1982
Apple sues Franklin Computer Corporation for patent and copyright infringement

SEPTEMBER 1982
Woz holds first US Festival

"For competitive reasons," Apple stops announcing to the public how many systems it sells per year

1983

JANUARY 1983
Lisa and Apple IIe announced

MAY 1983
"Kids Can't Wait" (a program in which Apple donates 9000 computers to California public schools) begins

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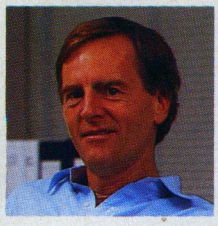
history has been an eventful one. Here are some highlights:

MAY 1983
John Sculley joins Apple as president and chief executive; Markkula becomes vice chairman



Apple makes its debut on the Fortune 500 list

Woz sponsors second (and final) US Festival

JUNE 1983
Millionth Apple II produced

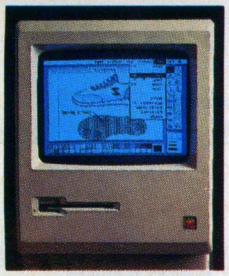
Introduction of ProDOS

JULY 1983
Woz returns to Apple

SEPTEMBER 1983
Osborne Computer Corporation files for bankruptcy

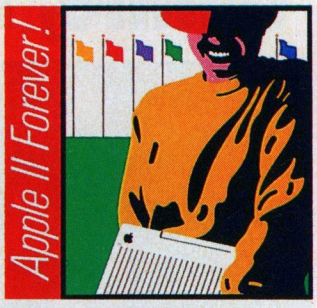
DECEMBER 1983
Introduction of ImageWriter and Apple III Plus

1984

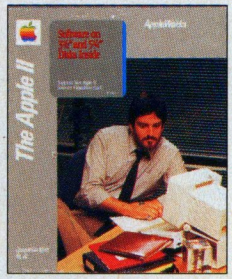


JANUARY 1984
Introduction of the Macintosh; the Lisa becomes the Lisa 2

Apple and Franklin settle out of court



APRIL 1984
Introduction of the Apple IIc



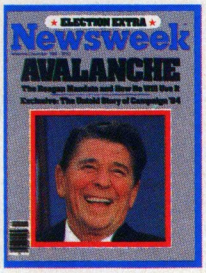
Introduction of AppleWorks

Apple III discontinued

MAY 1984
Alan Kay, key researcher on Xerox Star (the Mac's predecessor), becomes an Apple Fellow

SEPTEMBER 1984
Apple passes the $1 billion mark in its fiscal year

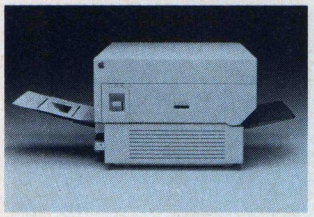
Fat Mac (512K) introduced



NOVEMBER 1984
Apple buys all ad pages in election issue of *Newsweek*

Two millionth Apple II sold

1985



JANUARY 1985
Introduction of LaserWriter and AppleTalk, components of the soon-to-be-abandoned Macintosh Office concept

The Lisa becomes the Macintosh XL

FEBRUARY 1985
Woz leaves to start a new company, CL9

Woz and Jobs receive National Technology Medal from President Reagan

MARCH 1985
Introduction of enhanced Apple IIe

Sculley asks employees to take a week of vacation and announces that manufacturing plants will close for one week

APRIL 1985
Macintosh XL (née Lisa) dropped from product line

MAY 1985
Apple reorganizes and brings Apple II and Macintosh product groups together—Jobs ousted from day-to-day management

JUNE 1985
Apple lays off 1200 employees and records a loss of $40 million, its first and only quarterly loss as a public company

SEPTEMBER 1985
Jobs resigns as chairman to start a new company, Next Inc.—Several Apple employees resign from Apple to join him

Apple sues Jobs, alleging that he breached his duties as chairman and misappropriated proprietary information

Introduction of several add-on products for the Apple II line, such as the UniDisk 3.5, Memory Expansion Card, and Catalyst, as well as a 20-megabyte hard disk for the Macintosh

OCTOBER 1985
Apple terminates its business in South Africa

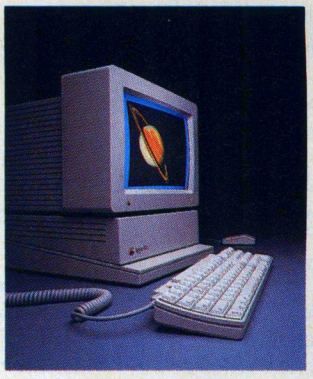
1986

JANUARY 1986
Introduction of the Mac Plus

Sculley becomes chairman

Apple and Jobs reach out-of-court settlement

FEBRUARY 1986
Jobs sells all but one share of his Apple stock, making Markkula the largest shareholder



SEPTEMBER 1986
Introduction of the IIGS

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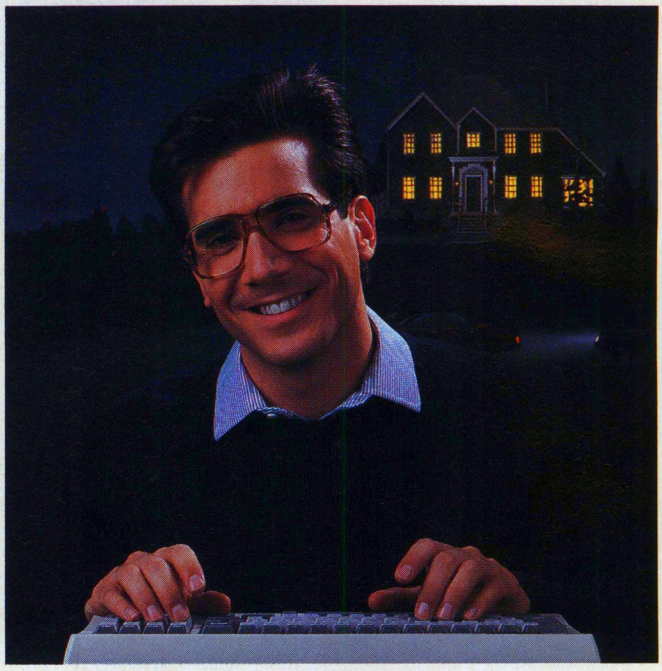

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THE NEXT DECADE:

AN INSIDER'S VIEW

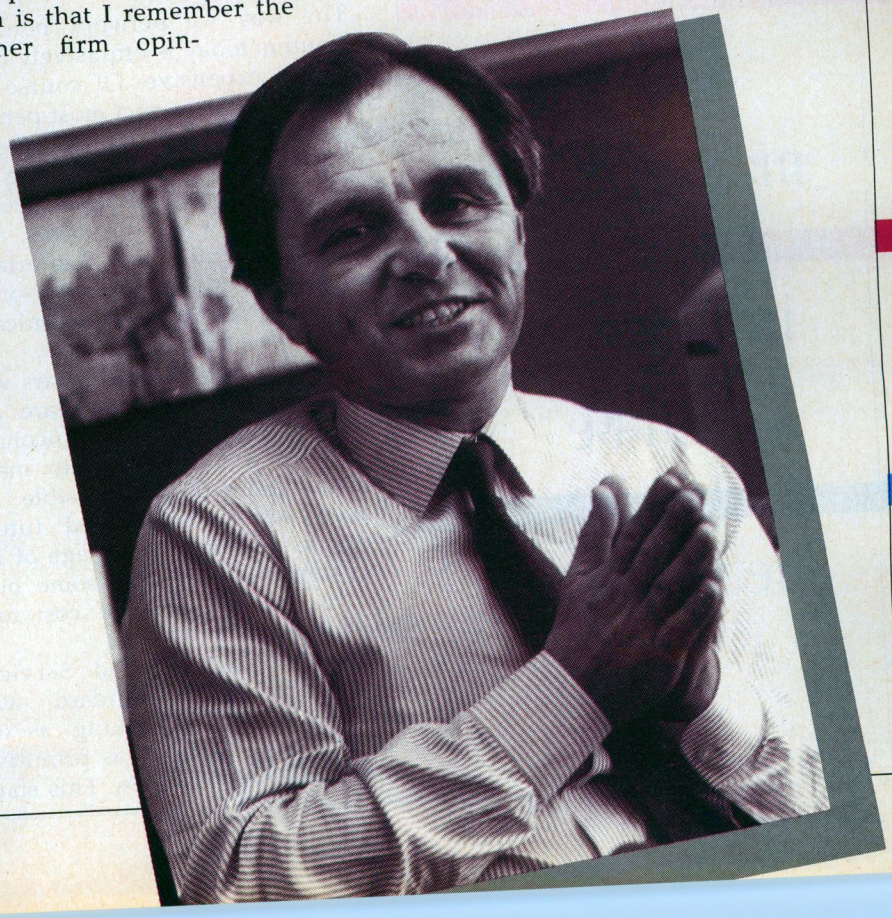
Ask a fish to describe water. That's one of my problems in discussing the future of the personal-computer industry.

In May 1985, Jean-Louis Gassée arrived at Apple Computer's Cupertino, California, headquarters from Apple France, where he had been general manager. His arrival was just before the tumultuous reorganization that stripped Steve Jobs of his managerial duties and led to plant closures and massive layoffs. Following these upheavals, Gassée found himself in charge of the newly combined Macintosh and Apple II groups. As Apple's vice president of product development, he's responsible for peering into the future and guiding the direction of Apple technology. Here Gassée offers his thoughts on the next ten years. Although he discusses personal computers in general, we can bet that some of these visions will show up in Apple own products.

Ask a fish to describe water. That's one of my problems in discussing the future of the personal-computer industry. The other problem is that I remember the rather firm opinions I held in the past, many of which have changed over time.

At the risk of presenting an excessively Applecentric perspective and with the memories of my less-than-insightful pronouncements, let me share with you my thoughts and hopes for the next ten years of the personal-computer industry.

The foremost consideration is how fast the industry will continue to progress. Contrary to a commonly held belief, I see the industry changing faster in the next ten years than it did in the past decade. More technology is ready, or being readied, for adaptation to personal-computer systems than ever in the past. Look at silicon, output devices, system software, storage devices, and networking, and consider the experience we have—scars and all—and you will share



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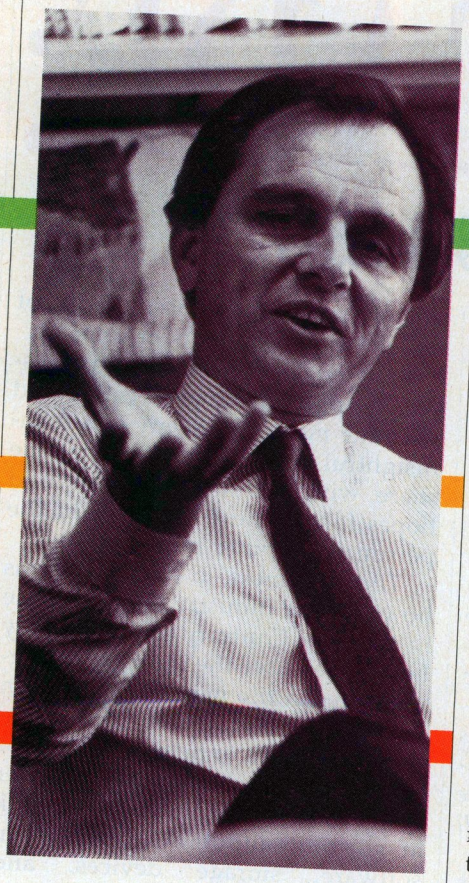


The major change in the 'how' will be networking.

my conviction that we are at the knee, not the shoulder, of the S-curve.

The automobile industry provides a parallel: Our cars have seen more technical improvements in the past ten years than they did in the previous decade—in braking systems, suspensions, engines, electronics, and overall reliability.

In the coming years, we will continue to see improvements in the speed of processors, capacity of RAMs and magnetic storage, and quality of display devices. It is, therefore, tempting to stick a "more of the same" label on our future. In a misleading way, that is correct. Personal computers are and will remain simulation engines. Personal computers are and will continue to be intellectual power tools, tools to help us think, organize, communicate, learn, and play. What will change is the "how" more than the "what."

Aided by all of the improvements in silicon, magnetic, optical, and system-software technology, the major change in the "how" will be networking, and it will probably usher in the second age of personal computing.

The way we network personal computers today is offensively complex and expensive. Of course, we can, in theory, connect most personal computers to most sources of electronic information. Each time we want to tap into another source, however, the wires, protocols, data structures, and user interfaces change—a forbidding proposition for anyone but the most technically inclined and affluent users.

The next two or three years will bring hardware and software devices designed to bury the inconsistencies in networks and to make access as convenient as possible.

However well executed future networks are, the camouflage of inconsistencies will place some burden on us, in terms of cost and performance.

The ISDN (Integrated Services Digital Network) standard will probably make networking, as we know it now, "sound" as primitive as LPs compared to CDs. This standard will make possible a combined voice and data line in your office or home with about 20 times the throughput we enjoy with today's 2400-bps modems. Imagine that this data link is as standard as the RJ-11 (telephone jack) plug is today.

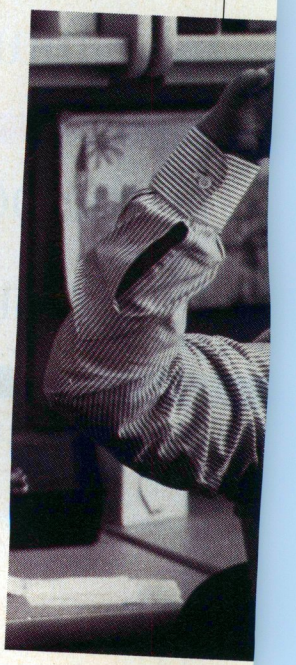
Imagine how the user interfaces will be influenced by the ability to quickly redraw a screen rather than wait for each character's placement on the screen. A two-minute program download will take less than five seconds.

Don't hold your breath for faster and newer applications enabled by the ISDN standard, though. We will need many years for the installation of this data-freeway system, but it will be worth the wait.

Besides better roads to sources of information, we will have another access to large volumes of stored knowledge: standard media, whether read-only, in the case of CD-ROMs, or read/write or write once read many (WORM), in the case of magnetic optical devices.

What will change personal computing is the way we will navigate these seas of data, either local or remote. The next ten years will see an evolution in the way we interact with large quantities of data.

Real people don't use SQL, a language for querying mainframe databases. What we want is personal-computing tools that help answer questions we did not know how to ask or that we should ask. What we want—and what we'll get—is a set of navigational tools that follow more closely our natural free-association thought processes. The way we use hand movements and graphics to supplement keyboard input and text is a good start. Bill Atkinson, the author of MacPaint, will soon offer us a



brilliant example.

The next ten years will see advances in user interfaces giving us the power to naturally utilize huge libraries rather than fighting with the "front ends" of remote on-line database providers such as Nexis or Dialog. Some of these advances will come from the work on expert systems. Ten years from now, our personal computers will have enough speed, memory, and system software to host "agents" silently collecting and preparing data for us as we work or sleep.

As I think of the shape of things to come, I can't help but mention that, in 1997, and probably much before, we will notice the absence of these machines in the same way we now notice the absence of a telephone.

Some of our computers will be much more compact than they are today. We will carry them around, we will write on them—not type—and they will keep in touch with the rest of the world through a cellular modem or an infrared link with the nearest telephone plug. I can't wait.

I remember the first computer store in Paris, I remember my first copies of *Creative Computing*, and the Altair kit ads, and the Haiku generators.

The journey will continue to be rewarding. *Jean-Louis Gassée*

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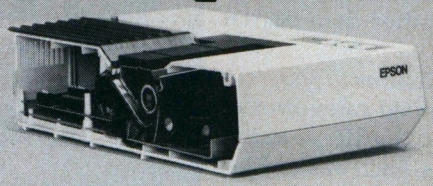

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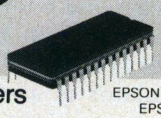

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A look at color displays for the IIGS

THE IIGS SHOWS ITS Colors

New technology often brings new questions and new choices. This maxim is certainly true of choosing a display device to use with the Apple IIGS, but the Apple IIGS also limits certain choices about RGB video display. You can use the IIGS with a variety of display devices: a television set, a monochrome or color composite monitor, or an analog RGB monitor, but you can't use it with a digital RGB monitor (sometimes referred to as TTL RGB).

Let's look at how these different devices work and examine why Apple chose analog rather than digital RGB for the IIGS.

Monitors vs. Televisions

There are two broad categories of display devices for the IIGS—monitors and televisions. Each has a video display (or picture) tube. A monitor, which is especially designed for use with a computer, connects directly with a cable to one of the two video ports on the IIGS. A television receiver requires an additional device called an RF (radio frequency) modulator to convert the video signal from the IIGS into a radio wave that can be received by the television's antenna.

Using a television to display video output is generally cheaper than using a comparable monitor. Most of us have at least one television set—usually a color set—in our homes. But the display on a television using an RF modulator is always poorer than the display on a good computer monitor. With the IIGS, another drawback is that you must use a special cable to connect the modulator to the computer. I had to get a cable custom-made for about $20 to try out this configuration.

Some television sets today come with a direct monitor connection. You can connect your IIGS directly to this type of set without using an RF modulator and without the deterioration in picture quality that results from using one.

You may think that digital RGB video surpasses analog RGB. In fact, just the opposite is true.

How the Video Display Is Created

The front of any display screen is coated with phosphors, materials that emit light when struck with a beam of electrons. If all phosphors emit the same color of light—typically white, green, or amber—the display screen is a monochrome screen. A color screen has three types of phosphors—one that emits a red color, one that emits a green color, and one that emits a blue color (see figure 1). The combination of these three colors produces other colors—for example, red, green, and blue together produce white; red and blue produce purple; and red and green produce yellow (see figure 2). These combinations provide the various screen colors.

A color picture tube has three electron guns, one designed to hit each of the three sets of phosphors. The guns emit electrons at slightly different angles so that each one hits only the phosphors it is meant to hit (see figure 3).

Composite vs. RGB Video Signals

There are two basic types of video signals—composite and RGB. A composite signal contains information about the red, green, and blue colors combined with information about the relative brightness of each color. This signal can be used by either a monochrome or color composite monitor and, if modulated, by either a color or black-and-white television. The composite signal is also called an NTSC signal after its developer, the National Television System Committee.

An RGB monitor receives the red, green, and blue signals separately. Because it does not need to decode the signal, it can receive more information per second.

Bandwidth, a measure of the amount of information that can be passed to the monitor each second, is

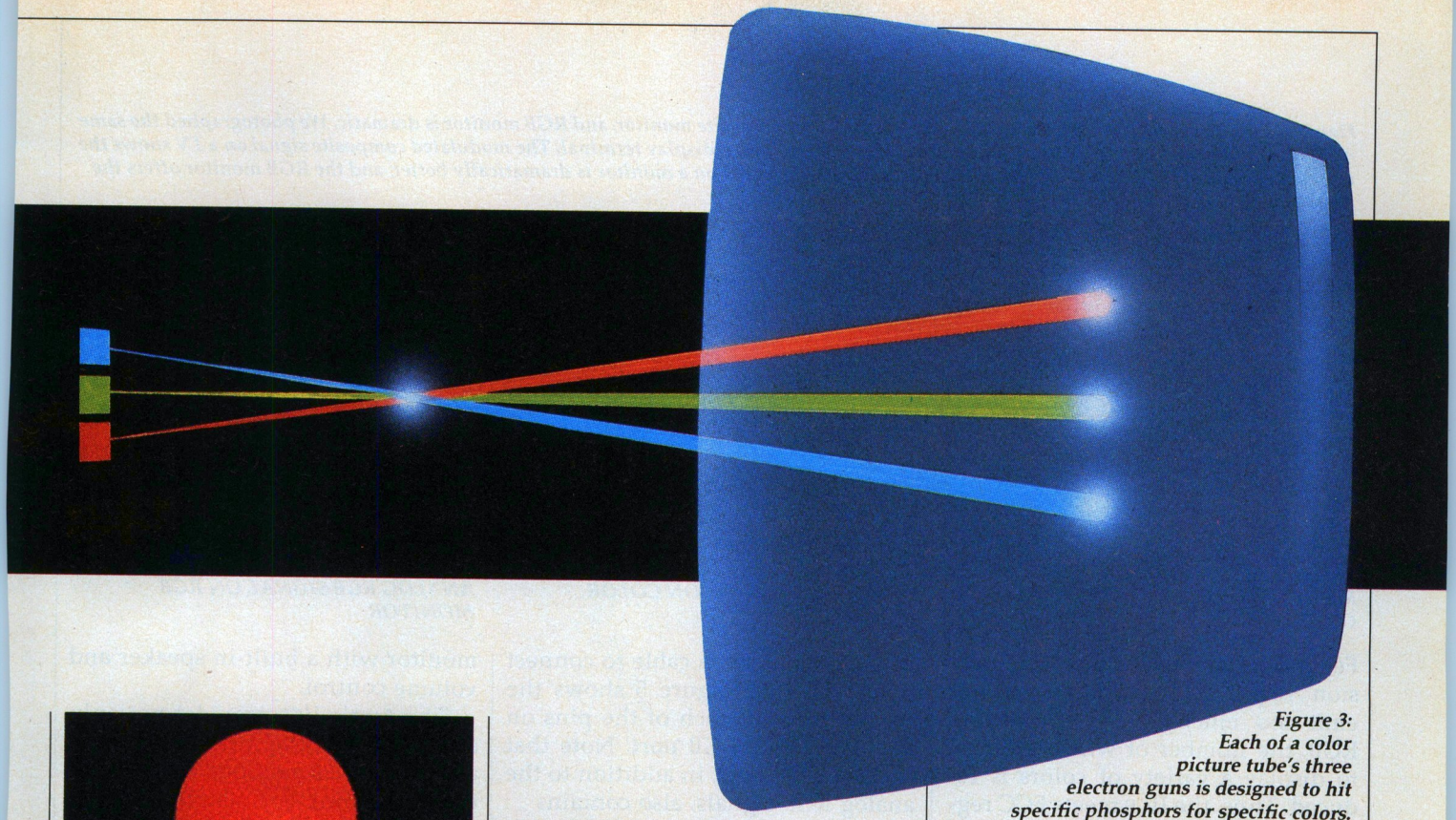


Figure 3: Each of a color picture tube's three electron guns is designed to hit specific phosphors for specific colors.

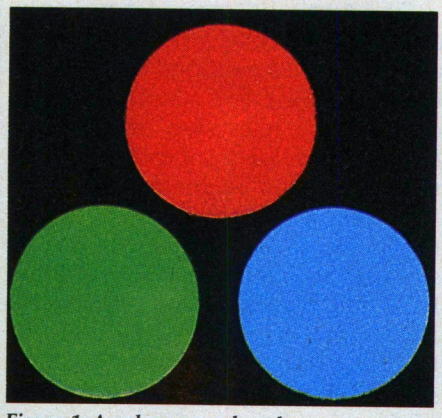


Figure 1: A color screen has three types of phosphors, one that emits red, one that emits green, and one that emits blue.

an important factor in picture quality. The higher the bandwidth, the more information the screen can contain.

Most color composite monitors have a bandwidth between 4 and 5 MHz, which is wide enough to display only 40-column text sharply. These monitors also have a somewhat fuzzy display when showing images from software using the IIGS's super-high-resolution graphics modes (see figure 4).

In most cases monochrome monitors have a sufficiently large bandwidth, more than 9 MHz, to display sharply 80-column text and super-high-resolution graphics. RGB bandwidth is always larger than 15 MHz. But comparing RGB with composite on this basis alone isn't that useful because they're really two different types of signals.

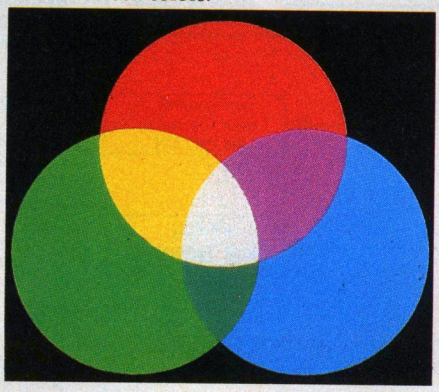
Digital vs. Analog RGB

The RGB signal on the IIGS is analog, but the typical signal on an RGB card on the Apple IIe or Apple IIc and on the IBM Color Graphics Adapter and Extended Graphics Adapter is digital.

Because digital sound, such as that produced by compact discs, is of higher quality than is analog sound, such as that produced by records, you may think that digital RGB video surpasses analog RGB. In fact, just the opposite is true.

A digital RGB monitor can display only a limited number of colors, based on its number of input lines. Many digital monitors, including the Apple Color Monitor 100 made for the Apple IIe and IIc, have a sin-

Figure 2: Different combinations of the three colors illustrated in figure 1 provide all the various screen colors.



gle line for each color and a line for brightness. These four lines are digital—that is, they are either on or off. Four digital lines can send 16 different values to the monitor, corresponding to 16 different colors. A digital RGB monitor with 6 lines (2 for each color) can display 64 (2^6) different colors.

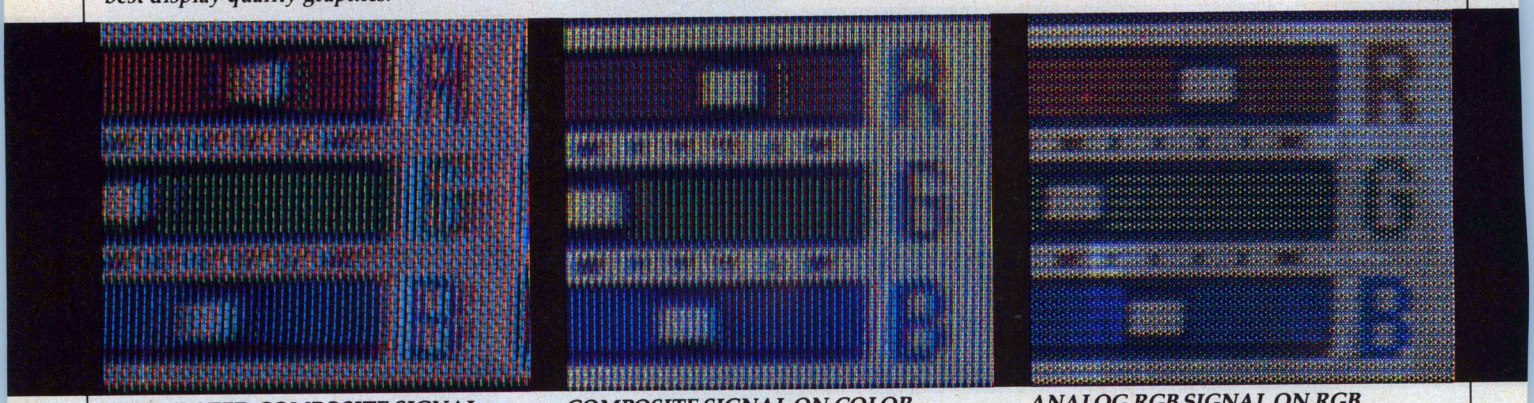
The color output of the Apple IIGS has 16 different shades each of red, green, and blue, resulting in 4096 (16^3) different colors. A digital RGB monitor would need 12 lines (4 for each of the 3 colors) to receive this color information. By contrast, the AppleColor RGB Monitor (analog) needs only 3 lines for the color information—one each for red, green, and blue. The signal on each color line is not on or off as on a digital monitor but is a varying voltage corresponding to the intensity of the color displayed.

Apple is not the only manufacturer to use analog RGB in its top-of-the-line color products. IBM uses analog RGB in the Professional Graphics Controller (which lists for nearly $3000), as does Commodore in the Amiga and Atari in the ST.

There is another reason for using analog instead of digital RGB. Every wire carrying a voltage that comes out of a computer emits some radio-frequency interference (RFI). The

ILLUSTRATIONS BY ADRIAN DAY

Figure 4: The difference between the display quality on a TV, composite monitor, and RGB monitor is dramatic. We photographed the same Apple IIGS Super Hi-Res (320 H by 200 V dots) graphic image on each display terminal. The modulated composite signal on a TV shows the most deterioration and poorest display quality, the composite signal on a monitor is dramatically better, and the RGB monitor offers the best display quality graphics.



MODULATED COMPOSITE SIGNAL ON COLOR TV

COMPOSITE SIGNAL ON COLOR MONITOR

ANALOG RGB SIGNAL ON RGB MONITOR

Federal Communications Commission requires that computers not emit too much RFI. With analog RGB, the number of wires required to display a variety of colors is reduced. Thus, the IIGS meets FCC regulations with less hassle.

Available Analog RGB Monitors

Besides Apple, several companies, including Commodore (Amiga), Conrac, Hitachi, Mitsubishi, NEC, Panasonic, Sanyo, and Toshiba, offer analog RGB monitors. (Apple's monitor is made by Mitsubishi.) Some monitors accept both analog and digital RGB signals, either through different cable connectors or by having a toggle switch. You should be sure that the monitor you select for your IIGS accepts analog RGB. If you select a non-Apple RGB monitor, you must also get a cable to connect it to your IIGS. Figure 5 shows the connections for each of the pins on the Apple IIGS RGB port. Note that the IIGS RGB port, in addition to the analog RGB signals, also contains

- an NTSC color composite-video signal
- a power supply of +12 and -5 volts
- a sound signal

The NTSC signal and the power supply provide the signals used by the RF modulator, should you choose to use one. (If you attempt to construct your own cables, make certain you make the proper wire connections, because improperly connected power-supply lines can damage your monitor.) The sound signal is not used on the AppleColor RGB monitor but can feed sound to a monitor with a built-in speaker and volume control.

The Apple IIGS provides not only an enhanced graphics display but also enhanced methods of showing these graphics. For many of us, the display of a television or a monochrome or color composite monitor will simply not be good enough.

In the past, Apple II owners had to plan for a double cost when considering RGB—the monitor and an RGB adapter card—but the Apple IIGS provides built-in RGB output. By doing so it has reduced the decision of choosing to use RGB to one of choosing from monitor types.

The choice for display, then, comes down to the familiar one of price versus features and quality. An RF modulator on an existing televi-

COMPUTER	VIDEO SIGNAL	VIDEO DISPLAY TERMINAL	DISPLAY QUALITY	COST
IIGS, IIe, IIc	Composite (NTSC) signal → Modulator	B&W or Color TV	**Poor** Barely passable graphic images. 40-column text readable, 80-column text unreadable.	$100 or more
IIGS, IIe, IIc	Composite (NTSC) signal	monitor connector on B&W or Color TV	**Fair** By passing modulator, cuts down picture deterioration. 40-column text readable, 80-column text unreadable.	$100 or more
IIGS, IIe, IIc	Composite (NTSC) signal	monochrome or color composite MONITOR	**Better** Most color monitors display only 40-column text sharply and IIGS super-high-resolution graphics are somewhat fuzzy. Monochrome monitors display sharp 80-column text and super-high-resolution graphics.	$100-$400
IIGS, IIe, IIc	Analog RGB signal	analog RGB MONITOR	**Best** Produces the highest quality graphics and sharp 80-column text.	$500 or more
IIe, IIc	digital RGB board → Digital RGB signal	digital RGB MONITOR	**Best** Produces the highest quality graphics and sharp 80-column text.	$500 or more

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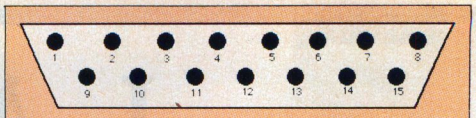

1- Ground: Ground reference and supply
2- Red: Red analog video signal
3- Comp: Composite synch signal
4- No connection
5- Green: Green analog video signal
6- Ground: Ground reference and supply
7- No connection
8- +12V: +12-volt power supply
9- Blue: Blue analog video signal
10- No connection
11- Sound: Analog sound output
12- NTSC/PAL: Composite video (NTSC in United States)
13- Ground: Ground reference and supply
14- No connection
15- No connection

Figure 5: The pin connections on the Apple IIGS RGB port.

sion produces a barely passable but low-cost image, but you also need a monochrome monitor for usable 80-column text.

A color composite monitor produces a somewhat better display. An Apple composite monitor can sense when it is receiving monochrome text and switches circuits to a larger bandwidth monochrome receiver. It displays usable 80-column text. Other color composite monitors lack this feature and oblige you to use a monochrome monitor for usable 80-column text. (The Apple composite monitor also has a button that allows you to convert it temporarily into a monochrome monitor.)

An analog RGB monitor offers the convenience of a single unit for both color and 80-column text—with highest quality graphics and text. But the price is usually more than the combined cost of a monochrome and a color composite monitor. The diagram on the previous page gives general prices for different types of monitors available for Apple computers and compares their display quality. ✚

Michael Fischer is author of The Apple IIGS Technical Reference *and* 65816/65802 Assembly Language Programming *(both from Osborne/McGraw-Hill) and coauthor of the* Apple II Expansion Guide *(Tab Books). He is an attorney, author, columnist, and programmer. He has owned and used Apples for nearly ten years.*

FURTHER READING

Wideman, Graham. "Computer Video Signals," chapter 14 in *Computer Connection Mysteries Solved*. Howard W. Sams & Co., 1986.

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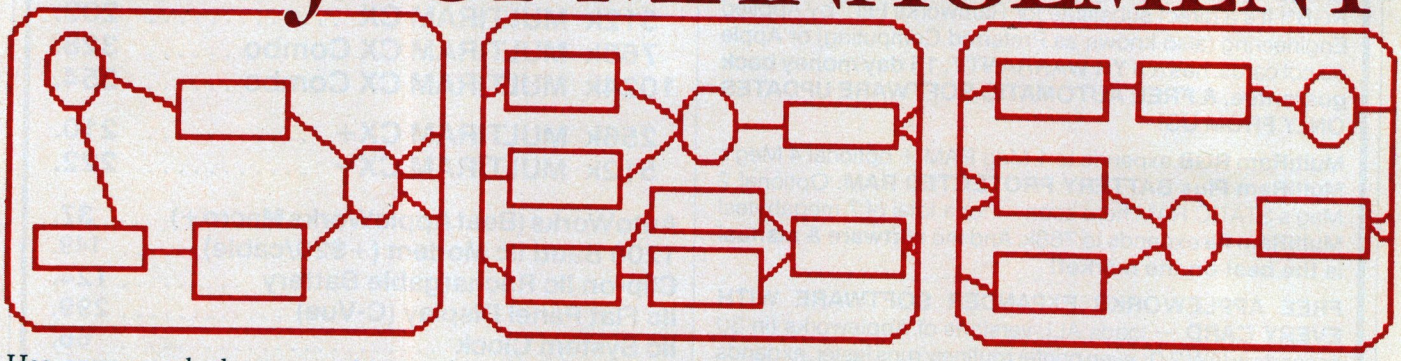


Has anyone asked you to whip together a refrigerator factory in the Amazon jungle lately? Have you felt a pressing desire to build your own floating island and get away from it all? Ambitious projects—and small ones—tend to go better with careful advance planning. Such planning may be something you relegate to scribbling on a napkin while you sip your morning coffee, and perhaps the to-do items in your business life require no more planning than paper-and-pencil notes.

On the other hand, you can avail yourself of project-management software, which can help you in several ways. Besides making complicated projects approachable, such software can help communicate your plan to other people. Putting anything onto a computer printout formalizes it to a certain degree. Your organization and commitment to a plan appear more convincing when you've anchored them to a detailed project schedule and flowchart. Finally, don't forget the bottom line: Effective project management can mean finishing on time and/or at less cost.

Project-management software is used much less widely than are spreadsheet, word-processing, and database programs, possibly because project management is a science couched in its own jargon. It doesn't have to be, though, and the principles are not that hard to grasp.

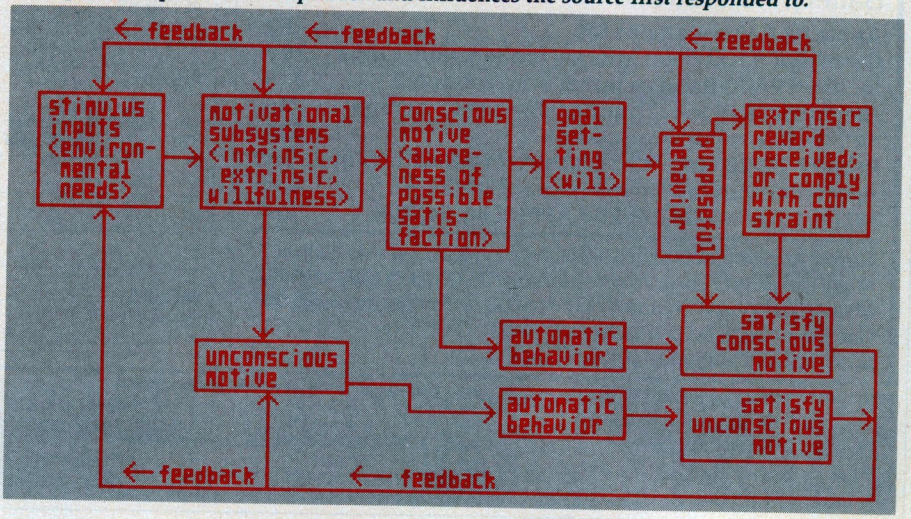
Abracadata of Eugene, Oregon, has introduced Everybody's Planner, a project-scheduling program for the Apple II series that bills itself as "the planning tool for the rest of us." The package rings of a home-usage program, showing such examples of project planning as installing a pool. Don't be fooled, though; Everybody's Planner has capabilities appropriate for the use of most small- and medium-size businesses.

Optional, but helpful, in using Everybody's Planner are a mouse, digitizing pad, joystick, or paddles. Using keyboard control alone is adequate, however. A monochrome screen is the best choice for keeping eyestrain down; Abracadata half-heartedly endorses using a color monitor with Everybody's Planner, but it results in difficult-to-read screens.

Getting Organized

Projects consist of tasks; milestones (events such as start, end, and important stages along the way); and the resources necessary to fulfill each task. Project-planning software usually includes critical-path management (CPM), Gantt charts, and a capability known as resource allocation. CPM is a method of shortening a project to its minimum duration by figuring out which tasks are on the "critical path," which ones cannot be stretched out without delaying the entire project. Gantt charts are

Figure 1: Abracadata's "Organismic Theory of Motivation" flowchart shows "feedback" concept as a response that loops back and influences the source first responded to.



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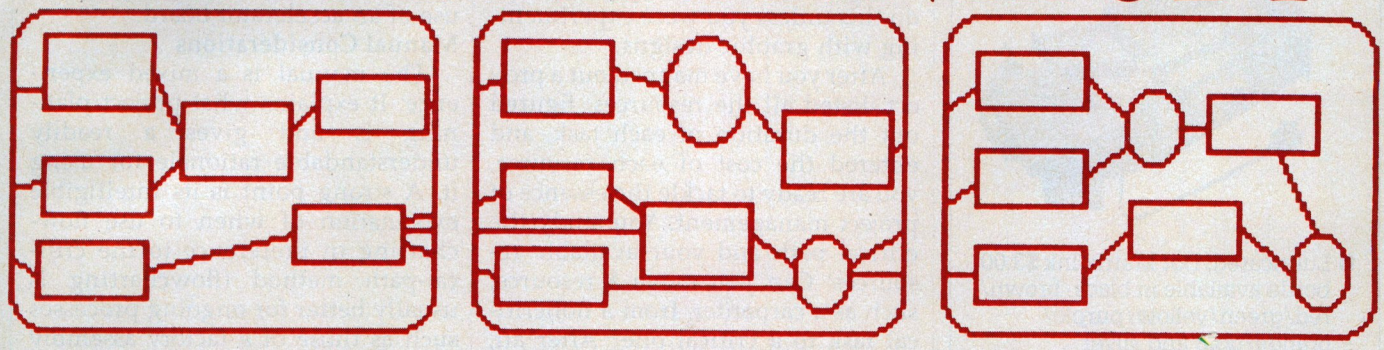


simply bar charts that show all the tasks and make it easier to see the relationship between the critical-path tasks and elapsed dates.

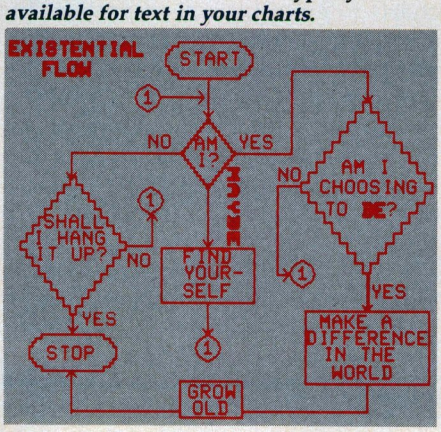
By assigning more resources (money, people, vehicles, tools, and the like) to the critical path, you can reduce the duration and/or overall cost of a project. That's where resource allocation comes in, to keep track of your available resources and help you use them to best advantage. Everybody's Planner handles CPM, Gantt charts, and resource allocation. In addition, it lets you design flowcharts on the screen, print them out, and "activate" them—i.e., present them in a semianimated fashion, with each successive event painted on-screen as you issue the command.

The program also features a well-rounded selection of report types. Besides the graphic reports (showing critical-path and Gantt charts), it has several expense-oriented reports that can be highly specific. For instance, you can request an analysis of the daily work schedules and cost of Worker #3 and Carpenter #5 on a particular project.

A project calendar can cover any time span up to five years long between the years 1985 and 2014. It allows for nonworking days and lets you set up a template for the work week.

The program lets you track up to 216 separate resources and as many as 24 milestones. The maximum duration of a single task is 999 days, which should accommodate projects of almost any size. The maximum daily cost of a single resource is $32,767, but even for massive offshore oil-drilling projects, you can consider each dollar as representing a thousand. Up to four resources can be involved in any single task. The hitches are that a project can include only 54 tasks and that all project calendars are figured in days. Many small-business projects, such as relocating a firm from one office to another, have far more than 54 tasks, so this limitation is not inconsequential. The only way around it is to break projects down into subprojects or parallel projects, which is not always feasible. The day-only framework of the calendar is suitable for most projects, but if you require a breakdown of tasks and milestones by hour, minute, week, or month, Everybody's Planner may not work for you.

Figure 2: Abracadata's "Existential Flow" chart shows two of the three typestyles available for text in your charts.



You can choose from three typestyles for text: normal, bold, and "little." Up to 70 little characters fit on a screen line, so they are handy for labeling inside chart shapes.

Getting Your Feet Wet

The best way to get started with Everybody's Planner is to carefully follow the manual, reading through it once first, since the instructions are a bit choppy and the keystroke requirements are not always clear.

With Everybody's Planner, you start a project plan by defining a "calendar." You assign a start date and define the work week; the most common scheme is to "turn off" Saturday and Sunday. Then you paint a shape on the screen to represent the milestone START. Next you place all the project tasks on the screen, give them unique names, and assign the resources necessary for accomplishing each task. Before assigning dates, you must also define an END milestone. You can toggle the dates on to check durations or off to study the task/milestone flow.

You can edit tasks and milestones until you have the flow just right. The project "map" moves from left to right, with tasks connected by straight lines. Each task cannot begin until after completion of the

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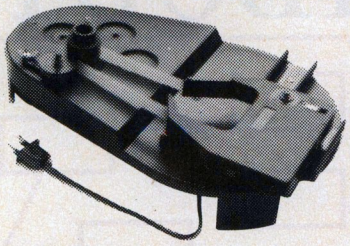

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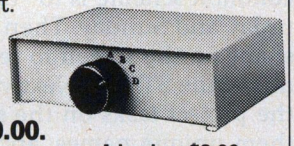

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connected task to its left.

A project can take as many as six screens. You can insert new screens in the middle of a project and move tasks from one screen to another. You enter labels and resources directly inside task or milestone shapes and can easily edit them. If your label is too long, you can resize the task shape to accommodate it.

I found that Everybody's Planner let me overlap two task or milestone shapes (but no more than two), although I'm not sure why you would do this unless you were experimenting with graphic designs.

After you have mapped out a project, listed all the resources, figured out the duration of each task, and entered the cost of each resource, you are ready to tackle the essence of project management. You study the critical path and your available resources. Can you move a resource, such as a carpenter, from a noncritical task to a critical one? After all, letting a noncritical task slip for a couple of days may not delay the overall project, while speeding up a critical task can mean you'll meet the project deadline.

If you have an idea of the cost of finishing the project one day, week, or month late, you can decide how much to spend for extra resources—more workers, carpenters, trucks, etc.—to complete the work on time or even early.

You can also study the "slack time" of any resource. If you find that certain workers will be idle for a couple of weeks, you might consider hiring temporaries rather than full-time workers or trying to change the sequence of tasks to keep a steady activity level. At this point, your project management becomes an intriguing "what if?" game, much like using a spreadsheet to tinker with numbers in search of the best results.

Everybody's Planner does its work about as rapidly as you can expect on the Apple IIe. The longer and more complex the project, the greater the delays in loading and drawing screens. Overall, the program's speed is acceptable, but it would definitely benefit from the use of an accelerator board.

Manual Considerations

The manual is a mixed experience. It explains what project planning is and gives a readily understandable rationale for using it. A strong point is its intelligible explanation of when to use flowcharting in preference to the critical-path method (flowcharting is usually better for ongoing processes such as those of a factory assembly line, and CPM is good for projects that must begin and end on specific dates.) The index is adequate. The documentation includes a Quick Command reference card with a list of common data-processing flowchart symbols.

Although the manual is easy to understand, it suffers from a lack of step-by-step examples to help you through the learning stages. Several of the flowchart examples deal with situations for which you would never use a flowchart—deciding whether your life has purpose or not, for instance (see figures 1 and 2).

Everybody's Planner is not hard to learn to use, but the documentation could do more to teach efficient

TIPS AND HINTS

For the best possible hard-copy output, I recommend rotating your charts to get multiscreen projects in a sequence and then reducing the printed results on a photocopier to improve the resolution. The program asks you for a magnification factor; in most cases, what works out best is an x factor of 3 and a y factor of 4, with your indentation set at 15 pixels.

Of the numerous printers the program works with, an ImageWriter II probably produces the most satisfactory presentation-quality results. Unfortunately, it cannot print the flowcharts in color, although future enhancements may let it do so.

In case you're wondering what Everybody's Planner calls Gantt charts, it refers to them as Task Charts (see figure 3).

When you make your backup copies for everyday use, don't use the "flippy" (both sides of double-sided diskettes) method. To save yourself from a burdensome amount of disk swapping, fill up four single-sided diskettes and always keep a formatted blank data diskette handy for when your data overflows the current diskette.

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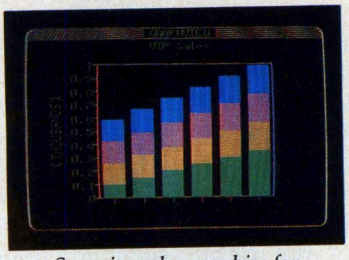

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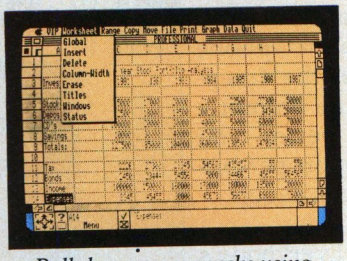

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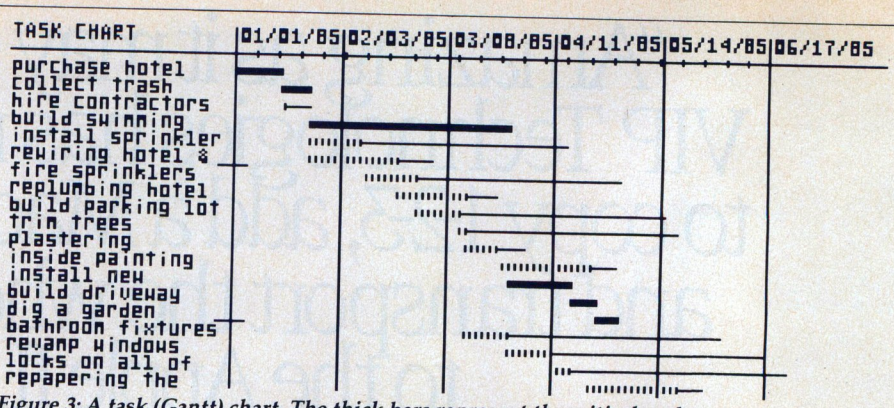


Figure 3: A task (Gantt) chart. The thick bars represent the critical path.

usage by describing shortcuts and common missteps. The diskette-based tutorials are superficial and noninteractive, and the screen menus are not always adequately informative. I had to spend an embarrassing amount of time to deduce that the way to leave the menu bar and get back to drawing a chart was to choose the Add Shape option. Another confusing menu is the one for entering task costs; it turns out to be where you input your costs per resource.

The program is adept at preventing you from entering invalid data and at catching nonsensical input. Everybody's Planner will not let you attach any dates to tasks and milestones until you've painted an END milestone on-screen.

The only glaring problem I encountered was when I configured Everybody's Planner for the right printer but the wrong interface card. When I issued the Print command, the program crashed and gave me a screenful of hexadecimal characters.

Although Abracadata's telephone support is not toll-free, the receptionist answers the phone promptly and quickly finds the person you need to talk to. The support personnel are competent and courteous.

Balance Sheet

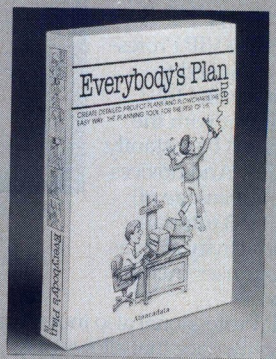
The strengths of Everybody's Planner are its price, its ease of use, the wide selection of report types, the ease with which it lets you edit projects, the variety of peripherals and interfaces with which it works, and the courteous telephone support from the manufacturer. Its weaknesses are the number of tasks it allows in a project, the restriction of the calendar to days only, its need for frequent diskette changes, and its tendency to crash when you configure it for the wrong printer or interface.

Although the program's price is quite reasonable, not many household projects, short of renovating a home or preparing it for sale, would justify the purchase of this product. In general, businesses require project scheduling, and home situations do not.

For businesses with an appropriate computer system, Everybody's Planner is an affordable project-management tool. Even if you just want an easy way to draw flowcharts and print them out, this program is probably worth the expenditure. If you can work within its task and calendar limitations, Everybody's Planner is an excellent choice for your project-planning and flowcharting tasks. ✚

Ives Brant has evaluated new products for ComputerLand Corporation and Pac-Tel InfoSystems. He is product-review editor at a leading microcomputer trade publication.

PRODUCT INFORMATION



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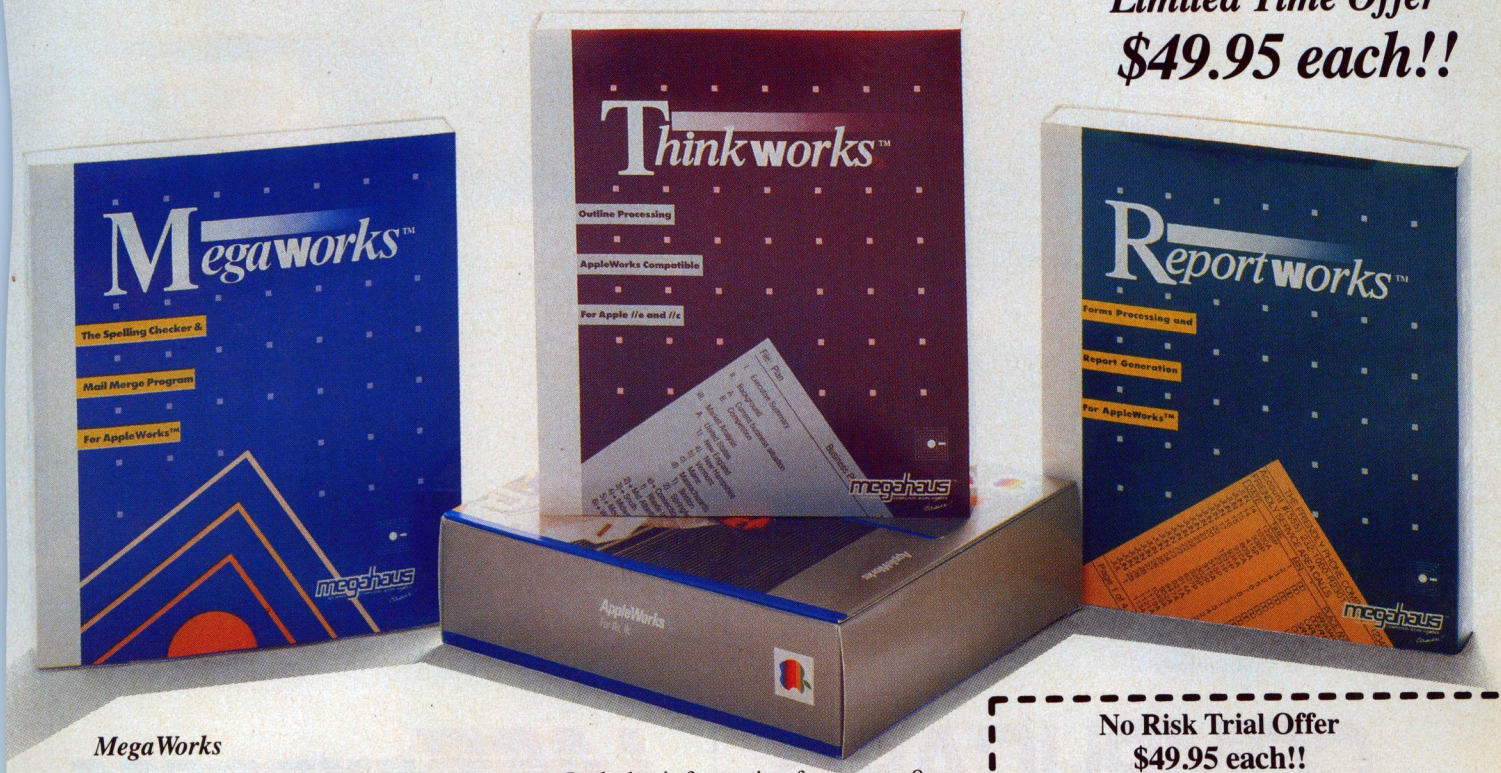

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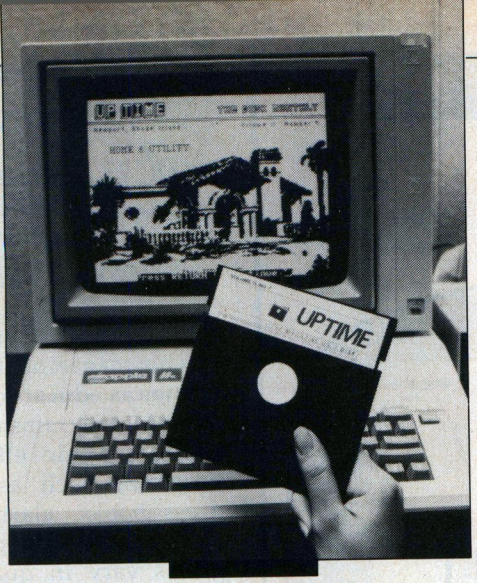

Quick Take

BY RUSEL DEMARIA

UPTIME

A disk-based magazine for Apple II-users that adds animation and inexpensive programs to your reading pleasure.

Computers are innovative devices, and their uses are legion. So when someone tells you about a computer magazine on a disk, you probably don't even bat an eyelash—but don't you wonder what such a product would be like?

UPTIME is just such a publication. Each issue has a cover, an inside cover for credits, a table of contents, an editorial, letters from users, product reviews, news items—and advertisements. And each disk has one thing more: working programs (ten of them). Each issue fills both sides of a single disk with information.

What sets a disk-based magazine apart from a paper-based magazine? Perhaps one of the operative words is *animation*. Another is *interaction*. On a computer disk, things can move, programs can run, sound effects can punctuate, and readers can interact.

The Flip Side

The flip side is that the limitations of disk space are apparent in *UPTIME*. The reviews and editorials are short, and there are few news items. Few, if any, of the programs would sell on their own; they tend to be simple and one-dimensional. On the other hand, the programs cost only a little more than 50¢ each (at $5.50 per issue), so if you like them, they are a bargain.

What is good news for some people might be bad news for others. For instance, some of the issues I've seen contain a cute method of moving through the magazine. You select the number of the item you want to view, and a small picture of a gun tumbles down the screen, accompanied by sound effects. The gun comes to a stop before your choice and shoots a bullet at it, highlighting the selection before the program runs.

As cute as this razzle-dazzle is—and it is funny—it takes time. It takes more time than it does to simply turn a few pages. If you don't mind the wait, then it won't bother you. After the fifth or sixth time you've watched the gun come tumbling down, however, it begins to lose its novelty, and you're just waiting for the next screen.

As critical as I am of the gun catalog, it is just that kind of feature that makes *UPTIME* fun. The imaginations of the people who contribute to the magazine make it live, the extra little touches make it special.

Another of *UPTIME*'s assets is its toll-free telephone number. The *UPTIME* staff welcomes contact with readers. People are encouraged to submit programs (the magazine pays nominal amounts for materials it uses, and you get the satisfaction of knowing that thousands of people are seeing your program). Each issue also has a survey that you can fill out and send back. In many ways, *UPTIME* is more an evolving and responding creation than most paper magazines are.

Some of *UPTIME*'s programs are pretty amusing. For instance, one of the issues offered Woman's Work. The program has you enter how many hours per week a housewife spends filling various roles (maid, psychologist, cook, nurse, tutor, and the like). You then assign hourly pay rates for each task to conform with the pay scale in your area, after which the program treats you to the total cost of "woman's work." It is pretty sobering. For instance, my wife performs tasks worth more than $600 a week (more than $30,000 a year) without pay! Good thing she doesn't have time to read computer magazines (just kidding, honey).

Among the other programs, you'll usually find a smattering of generally simple but amusing and somewhat challenging arcade-style games. They lack the graphic wizardry and complex interaction of commercial games but can keep you

Find out what entertainment packages are hot, new and guaranteed to stimulate your mind and tickle your funny bone every month in *That's Entertainment.*

The editors of A+ review all the new releases and let you know if it's the right game for you!

UPTIME *is more an evolving and responding creation than most paper magazines are.*

coming back to better your score.

The magazine includes such offerings as educational programs and quizzes, programs that display interesting graphic effects, and utility programs such as calculators, address books, alarm clocks, calorie counters, and calendars. These programs vary in quality and usefulness, but they are generally functional. If you want, you can transfer any of them from the *UPTIME* disk to another disk.

UPTIME also offers its subscribers special prices on commercial software. *UPTIME*'s guarantee reads: "If not completely satisfied with any item, please return it and we will either refund the full purchase price or replace the item."

A sense of the unexpected comes with a disk-based magazine, probably because of the versatility of computers and their advantages over paper media. On the other hand, I like the feel of a paper magazine, the photographs, the portability, and the greater depth of coverage.

I think there is a place for both kinds of products, however. The qualities that make each unique are, in themselves, worthwhile. I expect that the day may come when we will have almost no paper. Some people are predicting such a paperless society, but that day is a long way off and will come only with the advent of more-sophisticated computer technologies. For now, we have paper, but perhaps *UPTIME* is a forerunner of things to come. +

Rusel DeMaria is a free-lance computer consultant and columnist for The Maui News. *He lives in Hawaii.*

PRODUCT INFORMATION

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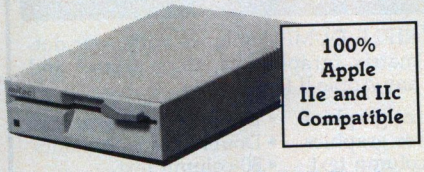

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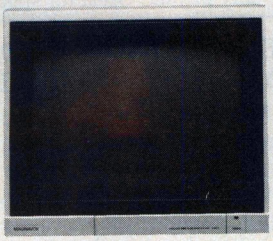

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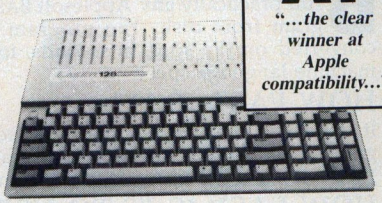

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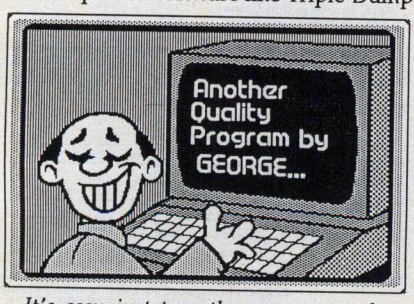
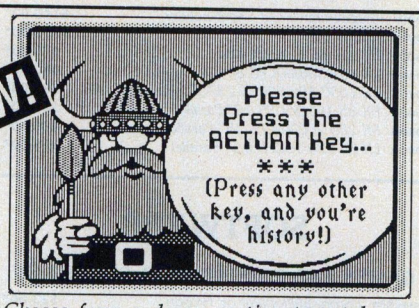


It's easy–just type the message on the screen, and save the picture on disk.



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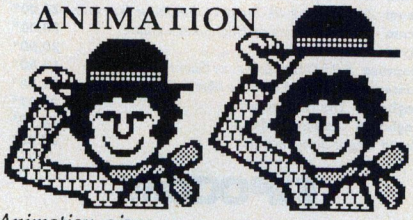

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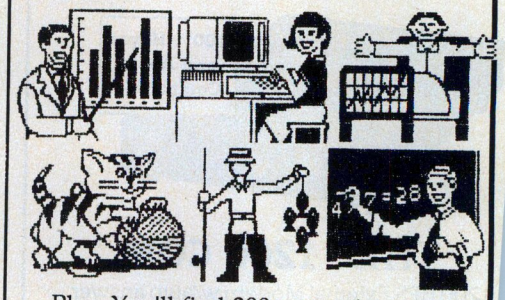

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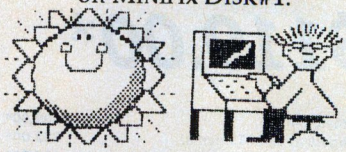

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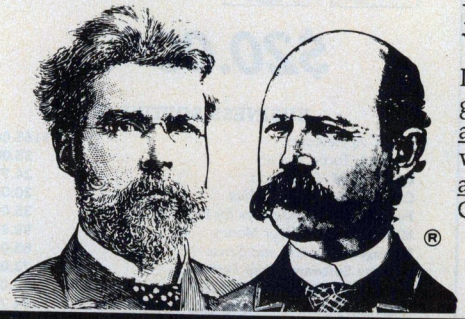

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FEATURE REPORT
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SHORT REPORT
POWER PRINT
TIP FOLDER
HELP FILE

A+ APPLEWORKS REPORT

This month we bring you a bibliography, a review of a font-downloading program, tips on keyword searching, and answers to readers' questions.

FEATURE REPORT *BY CHRISTOPHER VAN BUREN*

LOOK IT UP!

The number of AppleWorks books is growing steadily; AppleWorks is proving to be one of the most popular software-book topics ever. With the help of Janet Vratny-Watts at the Apple Computer Library, I've compiled a complete listing of books and reference materials for AppleWorks. Many of the entries include a brief description of the books' contents.

When comparing books of this nature, first decide what kind of information you need. These books fall into five main categories: general users' guides, advanced users' guides, reference guides, tip books, and special-application books. Compare books in the same basic category—there are several books in each. Chances are, if a book doesn't look as though it answers your questions, you're looking in the wrong category.

General users' guides are for learning the basics of AppleWorks and can supplement or replace the *AppleWorks User Manual*. They usually describe the basics of all three AppleWorks modules: word processing, database, and spreadsheet.

When you've mastered the basics, you might run into some problems in AppleWorks. Books in the advanced users' guide category help solve these problems by describing more advanced applications and features of the program. Many of these books describe how to transfer information between modules, how to set up spreadsheets, and more.

Reference guides are nontutorial guides to commands and functions in AppleWorks—usually organized in some reference style, such as alphabetically or by AppleWorks module.

Tip books contain collections of helpful hints you can apply while using AppleWorks. Many of these books approach tips as solutions to specific problems. A nice collection of tips is handy when you don't know where to turn for answers to perplexing AppleWorks questions.

Books in the special-applications category contain specific applications for the spreadsheet, word-processing, and database modules. Many of them are collections of applications in a specific category, such as business applications. These books tend to be more advanced because they assume you already know how to get around in AppleWorks. Be careful when purchasing application books: some present applications merely to help you learn more about the program; others provide applications intended for use in real situations.

I've placed books in categories for which they are best suited, but as you read over the titles and brief descriptions, you'll see that some

books could belong in more than one category. Many of the books have special applications to help describe features of the program, for example.

GENERAL USERS' GUIDES

AppleWorks & III E-Z Pieces: The Tutorial
Kenneth Green and Rika Van Dam
Dilithium Press, Beaverton, OR
1985
256 pages, $14.95

This book specifically covers III E-Z Pieces, an Apple III program that was the prototype for AppleWorks, and so is best suited for Apple II users. Data from III E-Z Pieces is compatible with AppleWorks.

AppleWorks Made Easy
Carole B. Matthews
Osborne/McGraw-Hill, Berkeley, CA
1985
224 pages, $17.95

This tutorial is meant to supplement the *AppleWorks Tutorial Manual* and *AppleWorks Reference Manual*, which come with the AppleWorks program. It's best for users with little or no experience with AppleWorks. It has beginning and intermediate chapters for each AppleWorks module.

AppleWorks: The Program for the Rest of Us
Michael L. Sloan
Scott, Foresman & Company, Glenview, IL 1986
320 pages, $18.95

This is a beginner-level text, and I think it is about average in comparison to some of the others. It includes the expected chapters on the program modules, plus chapters about cutting and pasting (the AppleWorks Copy command) and connecting files to other programs.

AppleWorks User's Handbook
Richard Rose
Weber Systems, Inc., Cleveland, OH
1985
200 pages, $12.95

This guide teaches AppleWorks by taking you through the steps of sample applications. The book is small and concise and offers no significant thrills.

AppleWorks with Advanced Applications: Calc, File, Write & Graph
Kenneth Close
William C. Brown Group, Dubuque, IA 1985
208 pages $13.95, paper; $24.95, deluxe edition with diskette

This text is useful for novice users but is especially interesting for advanced users who want to learn graphics techniques. A graphics simulator disk (the code is also in appendix B) provides examples of new applications. Most chapters have tutorials.

If a book doesn't look as though it answers your questions, you're probably looking in the wrong category.

Applying AppleWorks
R. W. Tamm
Bristen Press, P.O. Box 336, New Hartford, NY 13413. 1986
179 pages, $9.95

This appears to be a self-published book made directly from AppleWorks printouts. As such, it doesn't contain the smooth writing style of, say, Rubin's book (see Advanced Users' Guides below), nor the attractive packaging and production of the McGraw-Hill books. Tamm has done his homework and a noteworthy job of self-publishing, though. The book contains scores of diagrams and figures.

The Manual: AppleWorks
Robert E. Williams
Management Information Source, Inc., Portland, OR 1985
178 pages, $14.95

This is a bad attempt at rewriting the AppleWorks manual in a pseudotutorial style. It contains no illustrations and offers unimpressive writing and packaging.

Minute Manual for AppleWorks
Jim Pirisino
Minuteware, Columbia, MD 1986
150 pages, $12.95

Not reviewed.

The Power of AppleWorks
Robert E. Williams
Management Information Source, Inc., Portland, OR 1984
240 pages; $19.95, $34.95 with diskette

This book is for people who have minimal experience with AppleWorks. Williams intends to take his readers "one keystroke at a time" through the program, which may be too slow for some. The book contains exercises to practice as you learn. It is adequate as a basic introduction to AppleWorks but falls short as a serious learning tool.

Using AppleWorks
Arthur Aron and Elaine Aron
Que Corp., Indianapolis, IN 1985
400 pages, $16.95

This is a general AppleWorks guide designed for both beginners and advanced users. The first six chapters are introductory and cover the three main modules of AppleWorks, whereas the rest of the book gets more advanced by showing applications.

Working with AppleWorks
John Campbell and Sam R. Redden
Hayden Books (Division of Howard W. Sams), Indianapolis, IN 1985
320 pages, $16.95

Campbell and Redden's book covers AppleWorks very well, as its seven-page table of contents demonstrates. It contains eight appendices and five large chapters: Introduction, Word Processing, Spreadsheet, Database, and Putting It All Together. I found the writing a little cumbersome at times, but this small defect is offset by the book's attention to detail. This book contains more information than most of the others.

ADVANCED USERS' GUIDES

Advanced AppleWorks
David Bolocan
TAB Books, Blue Ridge Summit, PA
1986
256 pages, $16.95

Bolocan covers each AppleWorks

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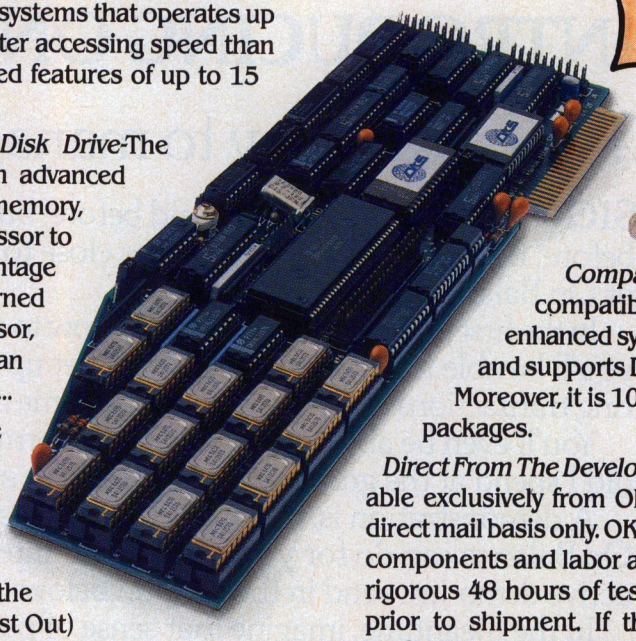

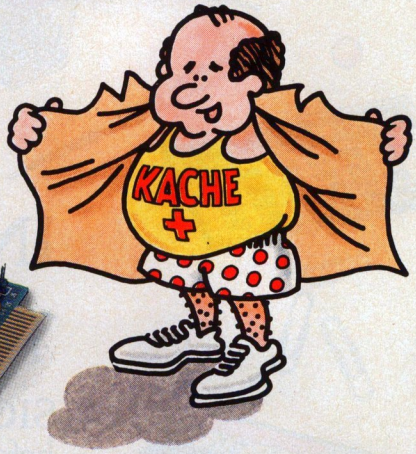

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module separately and concludes with some advanced applications. The book provides a well-rounded look at AppleWorks.

AppleWorks: Boosting Your Business with Integrated Software
Charles Rubin
Microsoft Press, Bellevue, WA 1985
320 pages, $16.95

Rubin is an excellent writer, and his book proves it: It's easy to read and logically organized. This is a semi-advanced text, designed to show experienced users more about printers, printer setup, various functions, and moving information between the AppleWorks modules. It contains a foreward by Rupert Lissner, author of AppleWorks (the program). This is the first book I turn to when I'm short of information about AppleWorks.

Rubin's is the first book I turn to when I'm short of information about AppleWorks.

AppleWorks Mastery
Christopher Van Buren
Scott Foresman & Company, Glenview, IL 1987
420 pages

This is my favorite AppleWorks book—just because I like the author (me). My primary goal in this book is to show how you can get AppleWorks to accomplish tasks for which it was never really designed. In doing this, I've tried to compile information that has not appeared elsewhere to supplement the standard tutorials and explanations. Because I'm a firm believer in AppleWorks enhancement programs, much of the book gives details about programs such as MacroWorks, ReportWorks, AutoWorks, and Pinpoint.

Extending AppleWorks
Mary Campbell and David R. Campbell
Osborne/McGraw-Hill, Berkeley, CA 1986
435 pages, $14.95

This book contains a great deal of information about special uses of AppleWorks. Its chapters are broken into advanced spreadsheet, database, and word-processor applications. It has a complete chapter on AppleWorks add-on products; those add-ons considered most useful by the authors are given several pages. Much of the information is helpful for specific needs, but some of it is impractical. I think the book could have been much shorter. This book is an excellent companion to the *AppleWorks Reference Manual*.

Mastering AppleWorks
Elna Tymes
Sybex Books, Berkeley, CA 1984
201 pages, $15.95

This book was one of the first on AppleWorks. It has been improved on by those that followed, but it is still quite good. It contains primarily business applications.

REFERENCE GUIDES

AppleWorks Pocket Reference
Christopher Van Buren
The Q-mar group, San Diego, CA 1987
35 pages, $3.95

Here, again, I must confess my slightly biased opinion, as I wrote the book. I decided that the AppleWorks quick-reference card might not be enough for some users but that a complete book can be too much. This is a pocket-size book that contains brief explanations of all AppleWorks commands and options.

Command Performance: AppleWorks
Charles Rubin
Microsoft Press, Bellevue, WA 1986
414 pages, $18.95

Like other books in Microsoft's Command Performance series, this one presents information in reference style. It has no table of contents but uses an extensive index and list of entries for cross-reference. It's not a reference to commands and options like the *AppleWorks Reference Manual* is, though; it's a reference to needs and explanations, including overviews of the modules, information about printing, and explanations of special features.

TIP BOOKS

AppleWorks: Tips & Techniques
Robert Ericson
Sybex Books, Berkeley, CA 1986
373 pages, $18.95

Ericson's book is well written. He covers important AppleWorks tips in six long chapters: The Desktop, The Word Processor, The Database, The Spreadsheet, Transferring Information, and Printer Information. The text is full of "Tips & Cautions" that explain many potential problems encountered in AppleWorks. Ericson obviously knows spreadsheets quite well; many of his best tips relate to spreadsheet functions.

Ericson's book is full of tips that explain many potential problems encountered in AppleWorks.

AppleWorks Tips & Traps
Dick Andersen, Janet McBeen, and Janice Gessin
Osborne/McGraw-Hill, Berkeley, CA 1986
291 pages, $16.95

This is a well-written book with scores of useful tips. The authors often present tips as solutions to "traps" found in AppleWorks, which makes the book useful as a reference when you get stuck in an AppleWorks problem. I enjoyed reading the book and often found myself saying, "I didn't know that!" Although many of the tips in this book are also found in Ericson's *Tips & Techniques* book, you'll find enough new ones to justify having both books.

SPECIAL-APPLICATION BOOKS

AppleWorks Applications
Lauren Flast and Robert Flast

Osborne/McGraw-Hill, Berkeley, CA 1986
125 pages, $9.95

This book contains specific applications designed to show solutions to business-related problems—from payroll to property management. Each application includes the formulas or a good explanation, so you can duplicate each example. I consider *AppleWorks Applications* best suited for an advanced education in AppleWorks, though, rather than for obtaining specific applications for your business.

AppleWorks for Educators: A Beginner's Workbook
Linda Rathje
International Council for Computers in Education, Eugene, OR 1986
153 pages, $15

This is a workbook that the author developed while teaching classes to new AppleWorks users. It teaches AppleWorks by giving lessons (or activities) and comes with a diskette of working examples. It also contains several case studies involving database applications.

AppleWorks for School Librarians
May Lien Ho
Hi Willow Research & Publishing, Fayetteville, AR 1985
129 pages; $10, $20 with diskette

This is a beginners' guide written especially for school librarians. You can purchase it with or without a lesson/template diskette.

Managing with AppleWorks
Ruth K. Witkin
Howard W. Sams, Indianapolis, IN 1985
305 pages, $17.95

This book is written specifically for business. It is well written, but you have to overlook some of the less-appropriate (but well-presented) examples.

Personal Money Management with AppleWorks
Ruth K. Witkin
Hayden Books (Division of Howard W. Sams), Indianapolis, IN
Price not available

Witkin's second book (forthcoming) will show you how to manage your personal finances with AppleWorks. It has many small chapters dealing with each of the three AppleWorks modules.

Practical AppleWorks Uses
David K. Simerly
Sybex Books, Berkeley, CA 1985
300 pages, $19.95

This text has many useful application examples and includes some information about connecting AppleWorks to a Macintosh. *Practical AppleWorks Uses* includes specific chapters on integration, the operating system, and working with other programs. +

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SHORT REPORT
BY CHRISTOPHER VAN BUREN

POWER PRINT

When it comes to improving the quality of your printed materials, nothing makes more of a difference than the use of special fonts (also referred to as typefaces). This is what the laser-printer boom is all about—and new breakthroughs in screen graphics almost always include the ability to select alternate fonts. But did you know that dot-matrix printers have been able to print with alternate fonts for years? Epson was the first to popularize graphics using dot-matrix printers, with its Graftrax chip for the MX-80, making it possible to control each dot position on the matrix individually. By positioning dots on a matrix, you can create many special fonts.

Power Print is a font-downloading program from Beagle Bros. of San Diego, California. A font downloader handles all the work involved in programming fonts for graphic dot-matrix printers. Without a font downloader, you would need to know BASIC or some other programming language to program fonts into the printer.

The term *downloader* is used because the program takes all the data needed to generate a font and loads it into the printer's memory. The advantage of downloading is that once the font is in memory, everything that passes through the printer comes out in the downloaded font. The problem with downloading is that turning the printer off erases the download buffer and the font is gone until downloaded another time. Although Power Print is not made specifically for AppleWorks, it does add significant power to AppleWorks printing. The Power Print manual contains a lengthy chapter on using the program with AppleWorks.

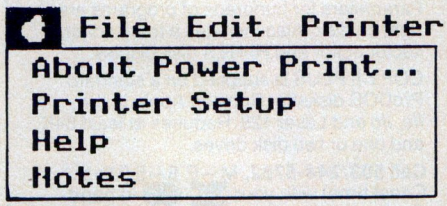

Figure 1: Power Print's Apple menu

The beauty of this program is its simplicity and straightforward design. It does everything you expect from a font downloader. It works with most dot-matrix printers and most interface cards and comes with several ready-made fonts for each printer. Power Print uses a high-resolution graphics display throughout the program. Menus are pull-down style and easy to use (see figure 1).

To begin, simply boot Power Print and select your printer and interface card from an extensive list on the menu. You can then choose one of the predesigned fonts for your printer and load it, using the Download as Font 1 command. You can use the Print Sample command to get a sample of the font on the printer, and then simply leave the printer on and start AppleWorks. Use AppleWorks normally, and everything you print will appear in the downloaded font. You can also switch between the downloaded font and the printer's built-in font by issuing simple printer commands from the AppleWorks word processor. All regular printer functions, such as boldface and underlining, work just as well with the downloaded font as they do with the built-in font. Between the printer functions, the downloaded font, and the built-in font, you can get a lot of variety in your printouts.

But it's not all so easy. You have to mess with the AppleWorks custom printer setup—even if your printer is one of the AppleWorks built-in printers. This requirement is because AppleWorks doesn't let you change any printer codes for built-in printers, which is necessary when

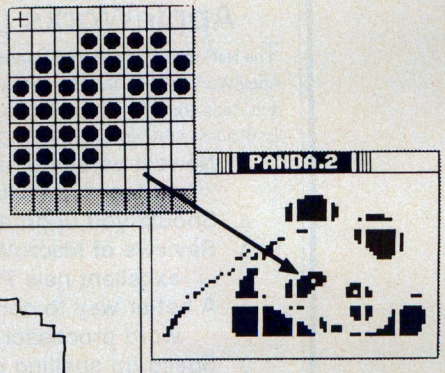

Figure 2: Using Power Print's font editor, you can arrange dots in a pattern to create your own fonts.

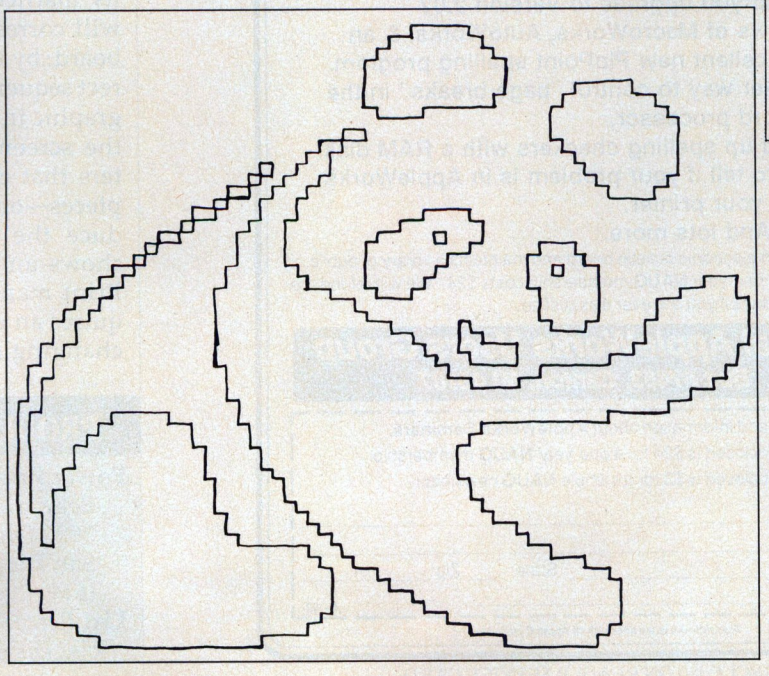

Figure 3: The printout of a graphic designed with Power Print

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The **National AppleWorks Users Group (NAUG)** is an association of AppleWorks users. **NAUG** members share information, hints, suggestions and ideas about AppleWorks through a monthly newsletter. Here is a partial list of articles that appeared in the December issue of the ***Forum:***

- Δ **Newest versions of AppleWorks software add-ons: What features are available?**
- Δ **Should you upgrade to Version 2.0?**
- Δ **Reviews of MacroWorks, AutoWorks, & an excellent new PinPoint spelling program.**
- Δ **A better way to control "page breaks" in the word processor.**
- Δ **Speed up spelling checkers with a RAM disk.**
- Δ **How to tell if your problem is in AppleWorks or your printer.**

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CIRCLE 180 ON READER SERVICE CARD

you're using Power Print. The Power Print manual does an excellent job of explaining custom printer setup in AppleWorks and the use of special printer codes, though. (Look for details about printing with AppleWorks in coming issues.)

Power Print has a font editor for customizing fonts. The editor can display a pattern for each character on the keyboard (an ASCII value) by arranging dots in columns and rows (a matrix). By entering dots into or erasing dots from the patterns, you can create your own fonts (figure 2).

Power Print's beauty is its simplicity and straightforward design.

Designing graphics and extra-large fonts is one of Power Print's strengths. To design a logo or graphic image, just plot it out on graph paper using the appropriate matrix size (printers have varying matrix sizes) and then convert it to Power Print by plotting the same points on its matrices. Pieces of the graphic will correspond to keys on the keyboard; by typing the keys in the correct sequence, you can reproduce the graphic in your printouts. Of course, the screen will display the characters that correspond to the graphic pieces—only the printout will produce the actual graphic. Figure 3 shows an example from the Power Print manual. Printing graphics requires an extra printer command for changing line spacing. ✚

PRODUCT INFORMATION

Power Print
Beagle Bros.
3990 Old Town Avenue
San Diego, CA 92110
(619) 296-6400
List Price: $39.95

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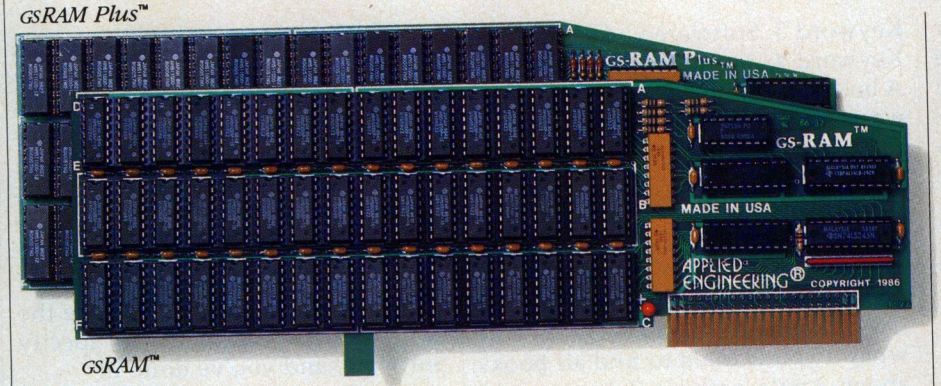


GSRAM™

Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

GSRAM and GSRAM Plus are available now, allowing up to 8 MEG of memory expansion. That's 8 times the memory capacity of Apple's card and just look at the benefits that only GSRAM and GSRAM Plus have over Apple's card:

- Lower cost
- Has 6 RAM banks (Apple's card has 4)
- Has memory expansion port
- Has ROM expansion port
- No configuration blocks to set
- No soldered in RAM chips
- Expandable to 8 MEG
- Expands AppleWorks internal limits
- Built-in Hi-Res self-diagnostic software
- 5 year hassle free warranty (Apple has a 90 day warranty)
- Made in USA

GSRAM for More AppleWorks Power

Only GSRAM and GSRAM Plus eliminates AppleWorks internal memory limits, increasing the maximum number of records available from 6,000 to over 25,000 and only GSRAM and GSRAM Plus increases the number of lines permitted in the word processing mode from 6,000 to over 15,000. And only GSRAM and GSRAM Plus offers a built-in printer buffer so you can continue using AppleWorks while your printer is printing. GSRAM and GSRAM Plus even expand the number of lines in the clipboard from 255 to 2047 and will auto segment large files so they can be saved on two or more disks. You can even have Pinpoint or Macroworks and your favorite spelling checker in RAM for instant response. GSRAM and GSRAM Plus will even display the time and date right on the AppleWorks screen. Nothing comes close to enhancing AppleWorks so much.

Turn Your IIGS into a Giant

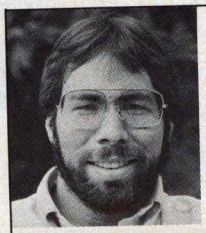
Simply plug GSRAM into the IIGS memory expansion slot and you've got up to *8 megabytes* of RAM at your fingertips—all of it instantly and automatically recognized by the IIGS. GSRAM is compatible with all IIGS software, including AppleWorks, as well as BASIC®, ProDos, DOS 3.3, PASCAL®, "C" and CP/M®.

Grow by Bytes or Megabytes

We offer GSRAM in two configurations so you can increase your memory 256K at a time (GSRAM) or a megabyte at a time (GSRAM Plus). Both offer full compatibility, lower cost than other boards, and easy expandability. And both are extremely low in power consumption. A fully expanded GSRAM operates at only 375 ma, and GSRAM Plus at only 270 ma (even with 6 megabytes on board!)

GSRAM—for Normal Memory Requirements

GSRAM is available with 256K, 512K, 1 MEG or 1.5 MEG of memory already on board. If you don't need the full 1.5 MEG now, you can choose a GSRAM with less memory and expand it up to 1.5 MEG in the future—or upgrade to GSRAM Plus for a small charge.



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Steve Wozniak, the creator of Apple Computer

With an optional piggyback card, you can expand GSRAM even higher than 1.5 MEG! (Other cards are only expandable to 1 MEG.)

GSRAM Plus—for Growing by Leaps and Bounds

GSRAM Plus is the first Apple memory card to use 1 MEG RAM chips on the main board. It's available with 1 to 6 MEG on board. If you don't need the whole 6 MEG now, you can buy a GSRAM Plus with less memory and easily expand it in the future.

GSRAM Plus can be expanded up to 8 MEG with an optional piggyback card.

Easy Expansion

Both GSRAM and GSRAM Plus use standard RAM chips that are readily available and just plug right in. So unlike other cards, you'll find expanding your GSRAM or GSRAM Plus easy, convenient and very economical. And with our optional ROM expansion module you can even increase the IIGS's ROM space and all in just one slot.

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GSRAM Plus with 1-8 MEG	CALL

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TIP FOLDER
BY CHRISTOPHER VAN BUREN

KEYWORD SEARCHING

AppleWorks offers two methods for database searching, which can be used separately or together. One method is to use the open-apple/F command, which finds specified information in any record in which it appears—that is, it searches through every category in every record of your database and lists all records containing the data you've specified. The other is to use record-selection rules, which are useful for separating portions of the database according to your search criteria. You can also combine both methods and search only specific records. For example, in a library application, each book or article in the database is given several "key" words that describe the contents of the information. A book about AppleWorks might have these keywords:

Keyword 1: Computers
Keyword 2: Apple
Keyword 3: Software
Keyword 4: AppleWorks

A book about some other Apple software might have these keywords:

Keyword 1: Spreadsheets
Keyword 2: Software
Keyword 3: Apple
Keyword 4: VisiCalc

Using the open-apple/F command, you can find all books with *software* as one of the keywords. But what if you wanted to find all books about Apple software? You would have to use the record-selection rules to select all the records containing one of the desired keywords and then use the open-apple/F command to find the categories containing the other desired keyword. You need to set up the record-selection rules like this:

```
Keyword 1 equals Apple or Keyword 2 equals Apple or Keyword 3 equals Apple or Keyword 4 equals Apple
```

To do so, enter the open-apple/R command and select the category Keyword 1. Now select the Equals option and press Return. Finally, enter the word *Apple*. Do this for all four keywords with or between them. Return to your database by pressing Escape, and you'll see only the records that have *Apple* as one of the keywords. Now you can use the open-apple/F command to specify Software, and you've done it!

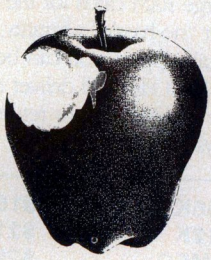
Another way to handle a keyword search is to combine all keywords into one category:

```
Keywords: Computers Apple Software AppleWorks
```

Now use the record-selection rules as follows:

```
Keyword contains Apple and Keyword contains Software
```

This method has the advantage of letting you combine more than two keywords in the search.



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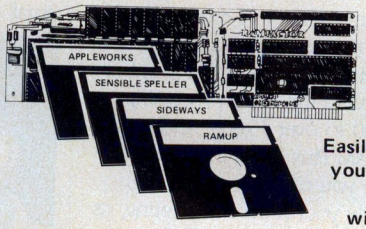

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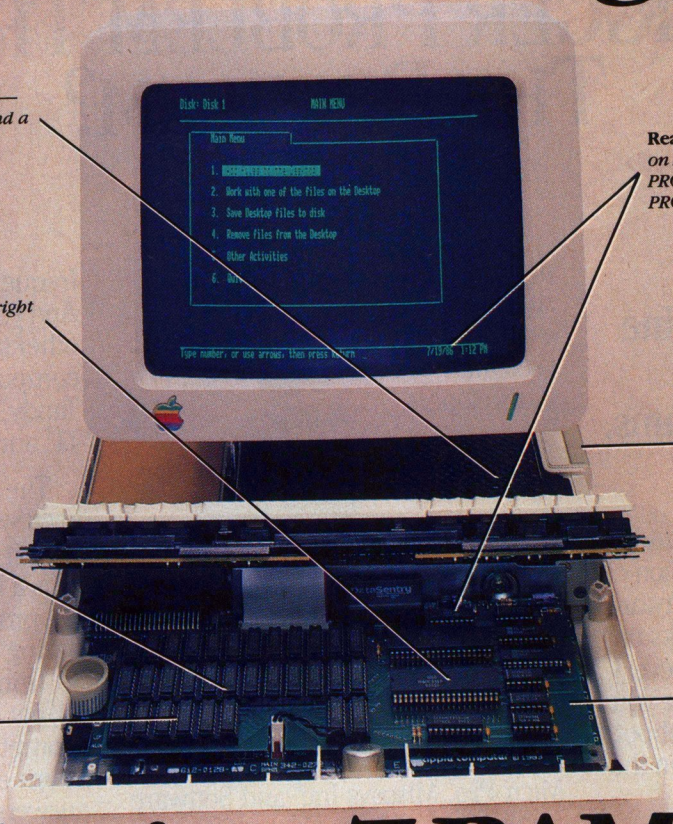

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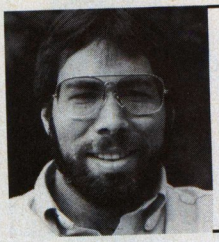
Your Apple IIc is about to become a computer you never dreamed it could be. Because the most exciting chapter in the Z-RAM history of turbo charged IIc's has just been written. It's called Z-RAM Ultra. And it takes IIc expansion into a whole new realm.



"I recommend Applied Engineering products wholeheartedly." (Of course, Steve's IIc has a Z-RAM installed.)

Steve Wozniak, the creator of Apple Computer

Ultra smart. Ultra speedy.

With any Z-RAM Ultra, your AppleWorks word processor capacity will instantly increase from 2,250 lines to over 15,000 and the maximum number of records from 1,350 to over 25,000. Available desktop memory rockets to over 700K with *all* of AppleWorks loaded into RAM. Z-RAM Ultra even expands the clipboard and autosegments large files so they can be saved on two or more disks. Nothing else comes close to enhancing AppleWorks like this!

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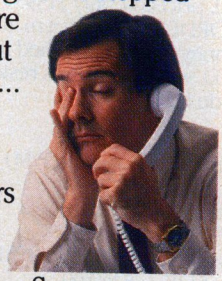

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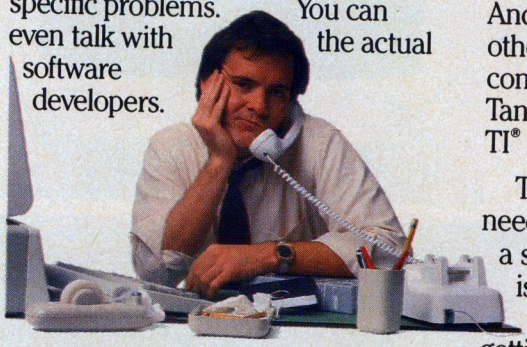

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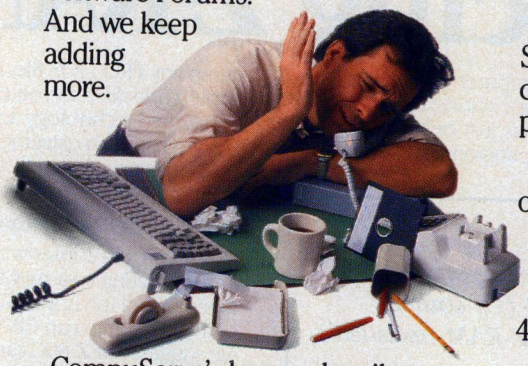

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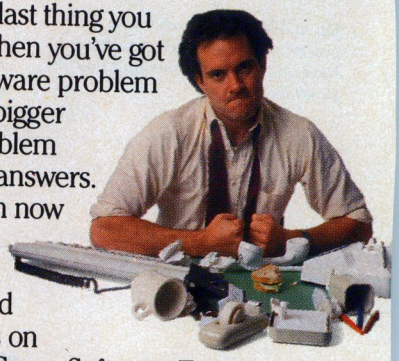

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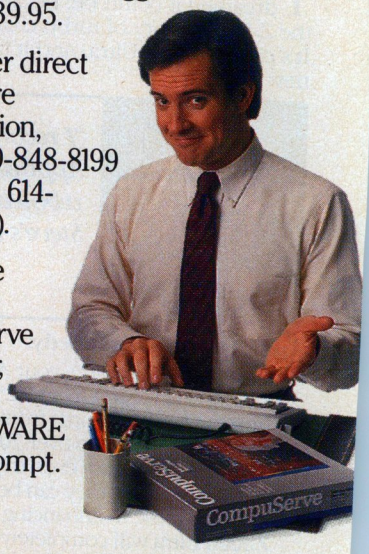

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CIRCLE 271 ON READER SERVICE CARD

QUESTIONS FROM OUR READERS

PRINTING NINE COPIES

Q. *How can I print more than nine copies of a document with AppleWorks? I have looked in sources of information available to me but without finding a lead. What is it about printing multiple copies that imposes a limit of nine?*

Wayne L. St. John
Carbondale, IL

A. Nothing about multiple-copy printing imposes this limit except the imagination of the programmer. Apparently nobody thought that users would need more than nine copies of any document. A similar decision was made about page numbering: early versions of AppleWorks number only to about 200 pages and then begin at 0 again. This limitation was eliminated in Version 1.3, but the limit of nine copies still exists in Version 2.0. To get around the limitation, use the open-apple/C command to copy your document and then paste it at the end of itself. This technique gives you two copies of the same document in the file. Use the NP (New Page) printer option in order to place a page break between the copies. Now you will get up to 18 copies of the document when you print the file.

THE CUPERTINO SYNDROME

Q. *I own an Apple IIe with a RAMWorks card that contains 1 megabyte of memory. When I use AppleWorks and leave the computer on for more than 15 minutes, the screen freezes. The only way to resume working on the text is to reboot, and I lose all the information I was working on! How do I resolve this problem?*

Robbie Jackson
Mount Vernon, NY

A. It sounds as though the RAM is overloading your Apple's power supply. The Apple II power supply has a built-in safety mechanism that shuts down the computer when the power supply is overloaded. Be grateful—if it weren't for this mechanism, your computer could be melting down the side of your desk right now. I suggest you purchase one of Applied Engineering's power supplies for the Apple II; they are made for larger-capacity systems.

Please send your questions and problems to Help File, A+, 11 Davis Drive, Belmont, CA 94002.

Christopher Van Buren is editor and publisher of the Q-mar group's AppleWorks Exclusive Reference *newsletter. His new book,* AppleWorks Mastery, *will be published in April by Scott Foresman & Co.*

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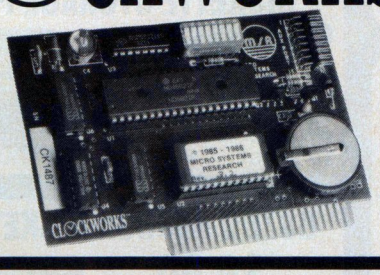

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BUILT-IN TIME SETTING COMMANDS	YES	NO	YES
CLOCK PRICE	$99.00	$129.00	$149.00
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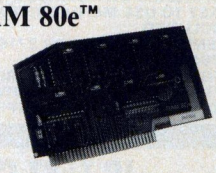
RAM 80e™



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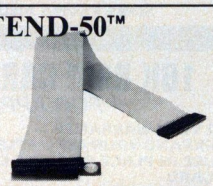

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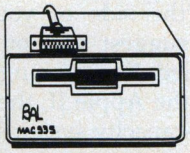

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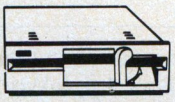

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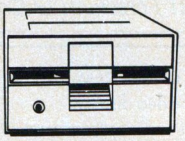

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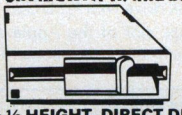

AP-150 $99.95

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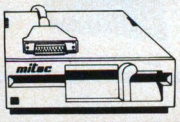
FOR APPLE IIc



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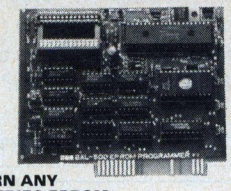

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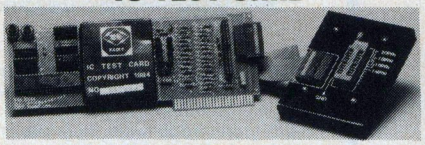
IC TEST CARD



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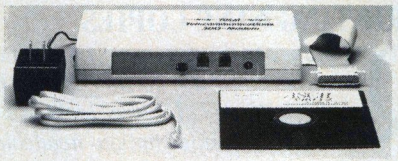

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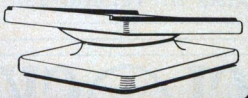

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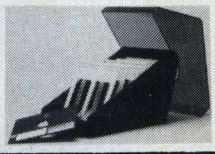

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CIRCLE 167 ON READER SERVICE CARD

BY DAVID D. THORNBURG

IS THE IIGS UPGRADE A SCHOOL'S BEST BUY?

It's a question of your students' needs

Last October I participated in an educational-computing conference in California that drew more than 2000 educators. Two questions cropped up frequently:

1. What did I think about the new Apple IIGS?
2. Should schools rush to upgrade their Apple IIe computers?

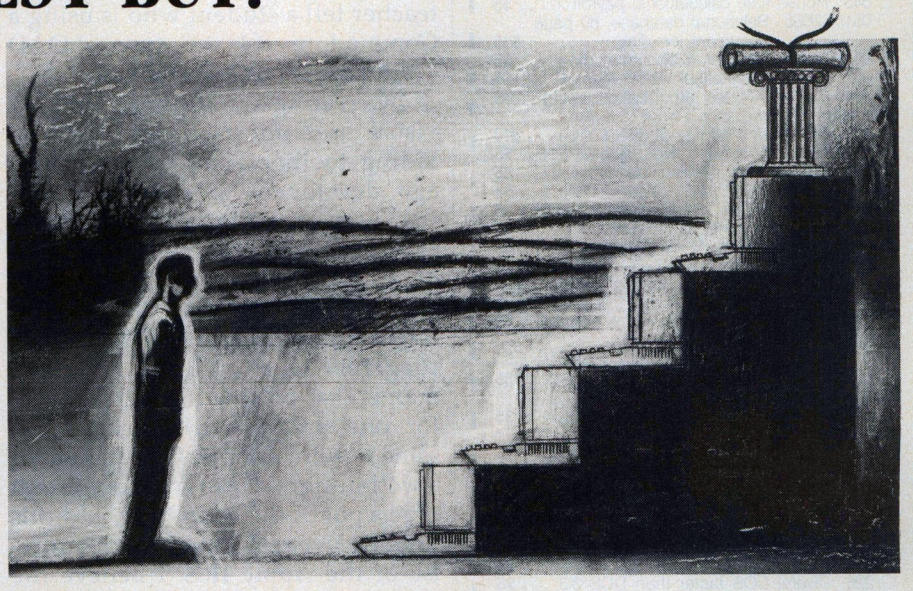
Easy One First

As someone who has long been critical of the original Apple II sound and graphics, I find the IIGS to be a refreshing sign that Apple is willing to provide people with the improvements they deserve.

The lowly Atari 400 (remember it?) ran circles around the old Apple II in the areas of sound and graphics, and the Commodore Amiga provides even richer capabilities in these areas. Quite frankly, some of us were beginning to wonder when Apple was going to wake up to the computers of the 80s.

By providing enhancements in graphics and sound while retaining compatibility with the massive installed base of Apple II programs, Apple seems to have achieved the best of both worlds, and the future of the Apple II line looks secure.

Of course, my personal interests influence my views. My office is littered with music synthesizers and graphics tools, and I spend much of my spare time tinkering with them. As a result, my enthusiasm for the Apple IIGS comes from the freedom this computer gives me to play in the domains that are of greatest interest to me.



What About Education?

As I look at the role of the Apple IIGS in education, I have a hard time separating my personal enthusiasm for this new machine from my perspectives on how computers are functioning in classrooms today and how they may serve in the future.

The challenges facing creators of educational software are challenges of the spirit, not of technology.

I agree with those who argue that educational software needs to take advantage of better graphics and sound tools. If you look at the history of educational software, you may conclude that software developers have not (with few exceptions) fully used the tools at their disposal. Few pieces of educational software exploit those capabilities that distinguish computers from books.

Yes, many new programs do show a willingness to accept the computer as a medium in its own right, but these programs have arrived nearly ten years after the introduction of personal computers.

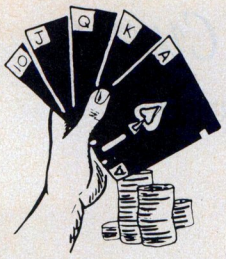
The challenges facing creators of educational software are challenges of the spirit, not of technology. I doubt that the simple introduction of a new computer into the marketplace can make the quality of educational software take a giant leap forward.

Opening the Toolbox

In addition to new graphics and sound capabilities, the Apple IIGS includes a set of toolbox routines with which software developers can create software with some of the look and feel of Macintosh programs. This toolbox may be the most significant distinguishing feature of the Apple IIGS.

ILLUSTRATION BY LARRY CARROLL

Your Best $5 Deal



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DEALER INQUIRIES INVITED

CIRCLE 256 ON READER SERVICE CARD

Although some computer users feel that command-line interpreters are preferable to visual displays of "desktops" and that typing RUN PROGRAMNAME is better than double-clicking a mouse on an icon, the visual user interface is steadily gaining converts and is convincing people that you don't have to know anything about computing to use a computer.

The education market is one where this feature is probably more important than anywhere else. Teachers do not have the time to wade through massive manuals just to learn how to load a program. Have you ever seen a second-grade teacher tell a student who is using a Commodore 64 to type LOAD "*",8,1? It is not a pretty sight.

By creating a uniform and highly visual user interface—and by providing toolbox routines to encourage developers to write software that uses this interface—the Apple IIGS promises to allow the creation of educational programs that are easy to learn and easy to use. Most important, as with most Macintosh programs, users will find that commands that behave in a certain way for one program will behave the same way for another. The benefit of a well-designed user interface is that it gets out of the users' way, and this unobtrusiveness is part of the promise of the Apple IIGS. I believe the Apple IIGS (in the hands of the right programmers) will be a showcase for some excellent educational software.

And Now for Question 2

All of which brings me to the second question: Should schools rush to upgrade their old Apple IIe computers to the Apple IIGS?

My guess is that, over the long term, Apple will phase the Apple IIe out of production as soon as demand falls and that the Apple IIGS will become its logical successor. The IIGS's ability to use existing peripheral cards and equipment is essential to this transition.

To show just how compatible the IIGS really is, I connected a 1979 Apple II disk drive (with a new connector) to the disk-drive port of the Apple IIGS, and it worked perfectly. Such attention to compatibility is unprecedented in the personal-computer industry.

Still, it might be wise to wait a bit before rushing to purchase the upgrade. For one thing, there isn't much software that requires the IIGS yet, although this situation is sure to change soon.

Cloning Around

Second, you can spend the money elsewhere. Even with special institutional discounts, upgrading the IIe to the IIGS is going to cost several hundred dollars.

A few months ago, a friend dropped by to show me a Laser 128 with a built-in disk drive and all the printer and communication ports you could ask for. He'd paid about $370 or so for this Apple II-compatible computer. Spend another $70 for a monochrome monitor, and you'd have a complete computer system for close to the price of the IIGS motherboard alone. Never mind new disk drives, mice, and other devices you need to take full advantage of the GS.

The point here is that no one should upgrade a computer for its own sake.

Most schools are trying to reduce the student/computer ratio. For people in this situation, the purchase of another computer may make much more sense than spending money on an upgrade at this time.

What Are We About?

The point here is that no one should upgrade a computer for its own sake. The whole reason we have computers in the classroom is to help our students. As we make purchase decisions regarding software and hardware, our overriding concern should be to ensure that the students' needs are served. For some of us, working toward this goal requires that we get more computers, and for others it means that we should make our existing computers more powerful.

Should you upgrade your Apple IIe computers to the Apple IIGS? Think about your real needs—the answer will be obvious. ✚

David Thornburg is a consulting editor of A+ and is actively engaged in the design and creation of computer-based tools that foster the development of creativity in their users. He can be reached in care of this magazine.

Power Play.

In personal computer performance, power makes the difference. When you increase your computer power, you improve your performance. It's that simple.

WordPerfect 1.1 for the Apple IIe/IIc and the new Apple IIGS* works on that perfectly simple premise. And works beautifully. WordPerfect 1.1 is the word processor designed to get the most out of your Apple IIe/IIc or IIGS. The most power. The most efficiency. The most functions. And the most for your money.

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WordPerfect 1.1 will give your Apple the power to process your words, thoughts and ideas like never before. With scores of useful and unique functions, WordPerfect will do almost any word processing task you can imagine.

For instance, with WordPerfect 1.1 you can do footnotes, with automatic numbering and placement at the bottom of the page. And you can create macros, do a mail merge, set headers and footers, and check your spelling with WordPerfect's 50,000-word dictionary (115,000 words on Apple IIGS).

Plus text entry and display on WordPerfect 1.1 is twice as fast as on the previous version. And WordPerfect now supports true proportional printing for both HMI and microspacing printers.

WordPerfect 1.1 features include:

- 50,000-word spelling dictionary (115,000 on Apple IIGS)
- Align on any character
- Automatic formatting on screen
- Automatic page numbering
- Block features (bold, delete, move, save, underline, etc.)
- Bold and underline text
- Center text
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- Hyphenation, automatic prompting
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For all its capabilities and functions, WordPerfect 1.1 is remarkably easy to learn and use. By utilizing designated function keys and a template, WordPerfect doesn't require you to memorize strings of keystrokes. Features like bold, underline and center are easy to locate and just a couple of simple keystrokes away.

In addition, WordPerfect's newly revised step-by-step manual contains thorough learning examples for beginners and a complete reference section for experienced users. And on-line help screens are provided for easy assistance with individual functions.

An install program is also included to let you take advantage of expanded memory and other ProDOS-compatible hardware.

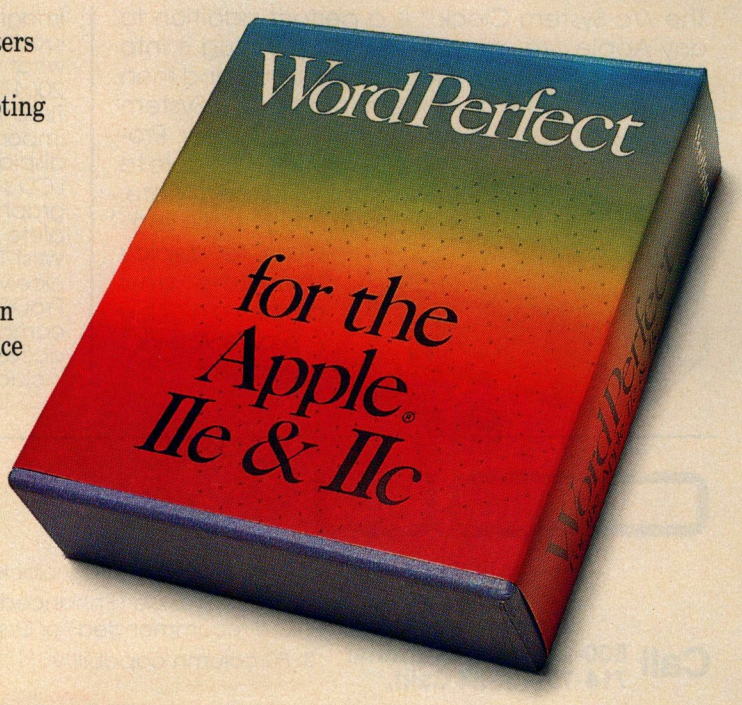
Harvest the Power.

Give your Apple a power boost today. Get WordPerfect 1.1 for the Apple IIe/IIc and IIGS. It's the perfect way to squeeze the most out of your Apple.

For more information, call or write WordPerfect Corporation, 288 West Center St., Orem, Utah 84057 (801) 227-4000.

*Runs under ProDOS-16.

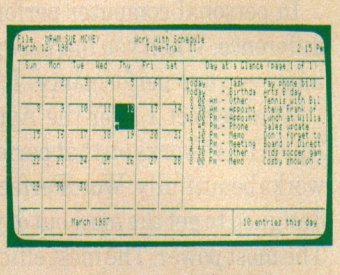
WordPerfect CORPORATION



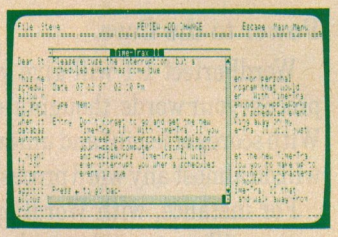
CIRCLE 118 ON READER SERVICE CARD

Time-Trax II

Please excuse the interruption, but a scheduled event has come due...



Time-Trax II™ is an active, time and date oriented calendar program. When a scheduled event is due Time-Trax II will beep and display your entry! Time-Trax II will remind you of meetings, appointments, errands, phone messages, birthdays, holidays, bills to pay and much more. With Time-Trax II you can even schedule advance notice reminders so that you are ready for your important event! No more excuses that you forgot to look at your calendar!



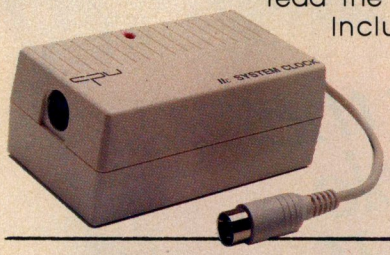
Time-Trax II is easy to use. With just a few simple keystrokes you can make, review, copy and edit entries. Easily change the time or date of an event and edit text of any entry. Time-Trax II's cut, copy and paste commands along with its clipboard makes it simple to enter regularly scheduled events. Search for any name, phone number or other information in any entry. Customize Time-Trax II with your own meaningful category labels for your entries. Print out a day, a month or any period of time easily. Keep schedules for any number of users.

And best of all Time-Trax II uses the AppleWorks™ user interface, so if you're using Appleworks you're ready for Time-Trax II!

Busy people everywhere need Time-Trax II. Time-Trax II can be installed as a Pinpoint Desk Accessory and then either run as a normal desk accessory or an active one! When active Time-Trax II will run behind other programs like AppleWorks, Manzanita BusinessWorks™ and Profiler™ and will actually interrupt you while you are working to notify you of a scheduled event!

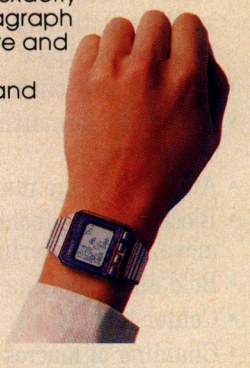
IIc System Clock

The //c System Clock™ is a perfect addition to any Apple //c or Laser 128. Simply plug it into either your printer or modem serial port and then plug your printer or modem into the //c System Clocks pass through port. Your ProDOS software will then be able to read the time and date. Included with software to display the time and date on the AppleWorks menu too!



SEIKO® DATAGRAPH 2001

Imagine having your Time-Trax II schedule loaded into a wrist watch. That's exactly what you get with the Seiko Datagraph 2001™. Now you can be anywhere and Time-Trax II will notify you of your important events with an alarm and display on an easy to read 4 line LCD screen. The Seiko Datagraph 2001 version comes complete with Time-Trax II, the Seiko Wrist Terminal (it's also a very nice watch) and a combination ProDOS clock/interface for your computer. No other cards or accessories are needed. We include everything you need.



SYSTEM REQUIREMENTS

1. ProDOS compatible clock
2. Apple //c, //e (Enhanced //e recommended) or IIGS
3. 80 column capability

PRICING

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CIRCLE 159 ON READER SERVICE CARD

BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

PALETTES, COLOR MIXING, AND DITHERING

Graphics take a quantum leap forward with the Apple IIGS

The Apple IIGS has arrived, with graphics that are a quantum leap better than standard Apple II graphics. While new GS software slowly trickles in, let's look at what the new platinum machines can do.

A Little Background

All Apple graphics modes are memory-mapped—that is, a pixel on the screen represents a bit or combination of bits in active RAM. The video display is generated by circuitry tied to this area of memory.

Prior to the Apple IIGS, memory for graphics was a problem. Because the entire graphics screen must be kept in memory and because the 6502 processor cannot use more than 64K of memory easily, Apple engineers used a bag of tricks—both in memory arrangement and in how colors were generated—to enable the Apple II to have such a colorful display. (For more information see "Seeing Double," *A+*, January 1985.)

The 65816 CPU in the Apple IIGS is capable of addressing 16 megabytes of memory, although the current IIGS allows only 8 megabytes of user RAM. Still, Apple engineers no longer need tricks. The super-hi-res IIGS modes (320 × 200 pixels and 640 × 200 pixels) use 32K of memory and are linearly mapped. Although you don't really need to know what linear mapping is, suffice it to say that it allows programmers to create much simpler graphics routines than they could with the earlier graphics modes.

Color was also a problem on earlier Apple IIs. Normal hi res on the Apple II relies on idiosyncrasies of the standard video signal to generate color. Color is tied to pixel position on the screen. Each pixel on the screen must be either violet or green (or orange or blue). Pixels adjacent to each other merge to white. Software that lets you plot or draw in green, for example, filters out the pixels of the violet. Thus when you draw a green line, every other pixel is lit. The result is that the resolution of the hi-res screen is halved. Double-hi-res is similar but a bit more complicated.

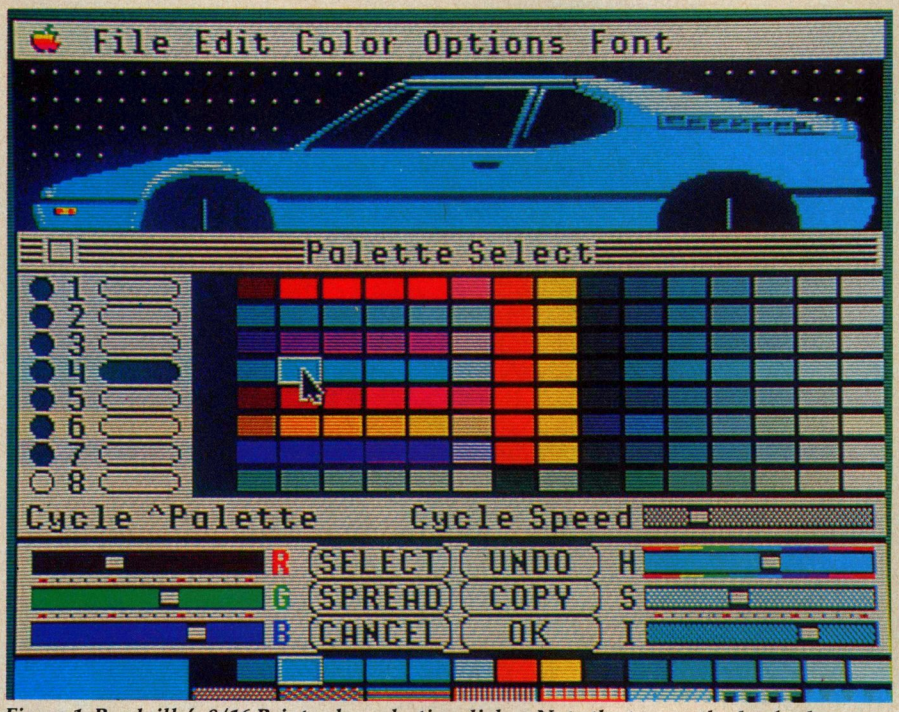


Figure 1: Baudville's 8/16 Paint color-selection dialog. Note the two methods of color selection. Either method can be used to create any of the Apple IIGS's 4096 colors.

Palettes are new to the Apple II family of computers; they use special areas of RAM.

The IIGS has no such color complications—at least not in the 320 × 200 mode. Each of the 320 pixels can take on any of 16 colors. This ability is accomplished by a new circuit in the IIGS called the Video Graphics Controller (VGC), which oversees all video output. The VGC doesn't have built-in color; instead it determines the colors to use by looking into "palette RAM."

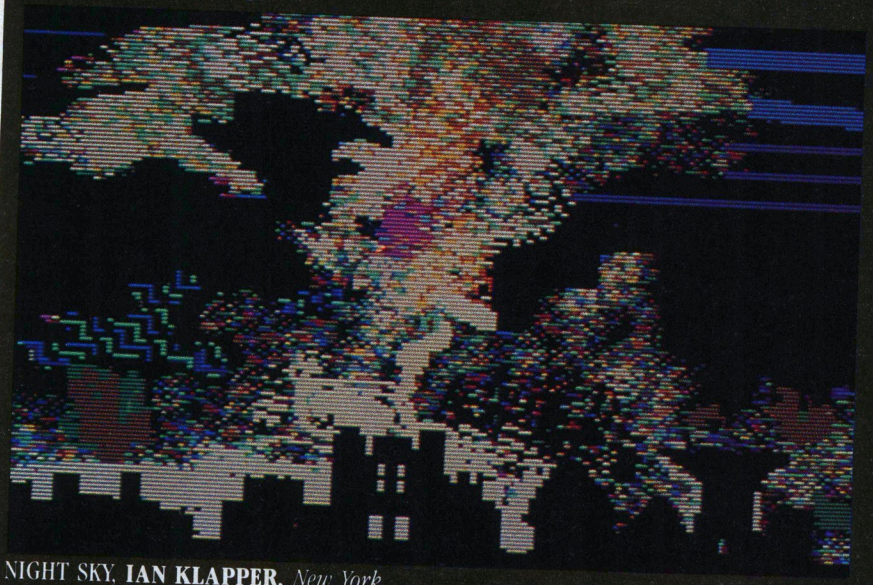
Palettes

Palettes are new to the Apple II family of computers; they use special areas of RAM that contain entries for the red, blue, and green components of the video signal for each possible bit combination in display memory. When the IIGS plots a point, it finds

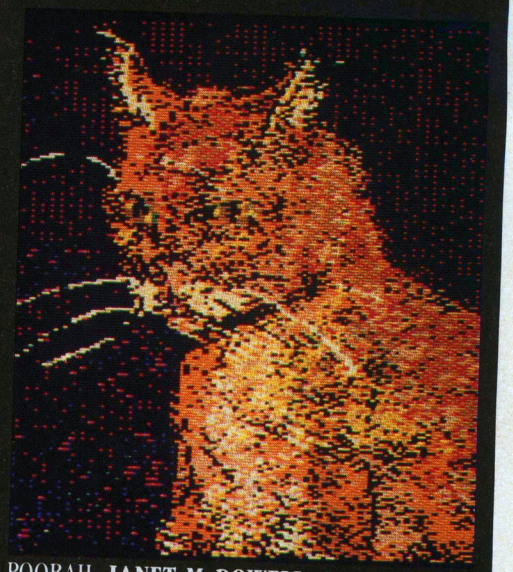
SPEAKING OF GRAPHICS GALLERY

A SKYLINE, A FELINE, AND THREE FACES

Hi-res and double-hi-res graphics provide lots of color on all Apple IIs. Poobah and Night Sky are double hi-res and were drawn on an Apple Graphics Tablet with Dazzle Draw by Broderbund. Klimpt, Japan, and Composition #1 are hi-res images and were drawn on the Apple Graphics Tablet with Blazing Paddles by Baudville and an assist by the Digisector Video Digitizer.



NIGHT SKY, **IAN KLAPPER,** *New York*



POOBAH, **JANET McDOWELL,** *New York*

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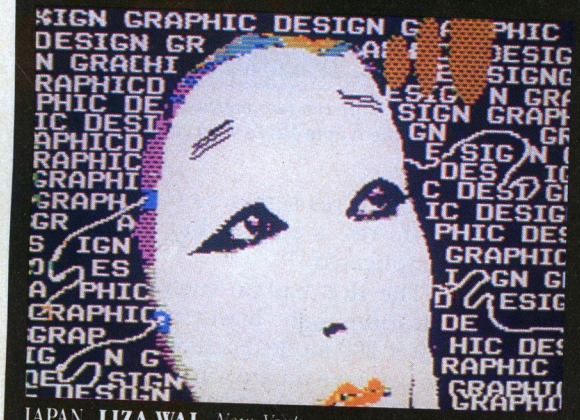
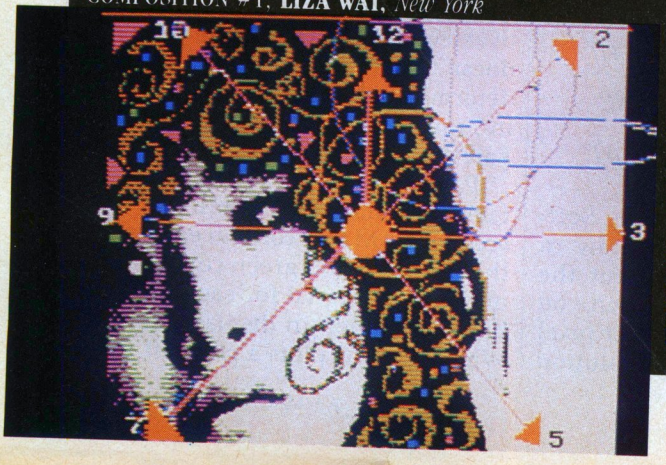
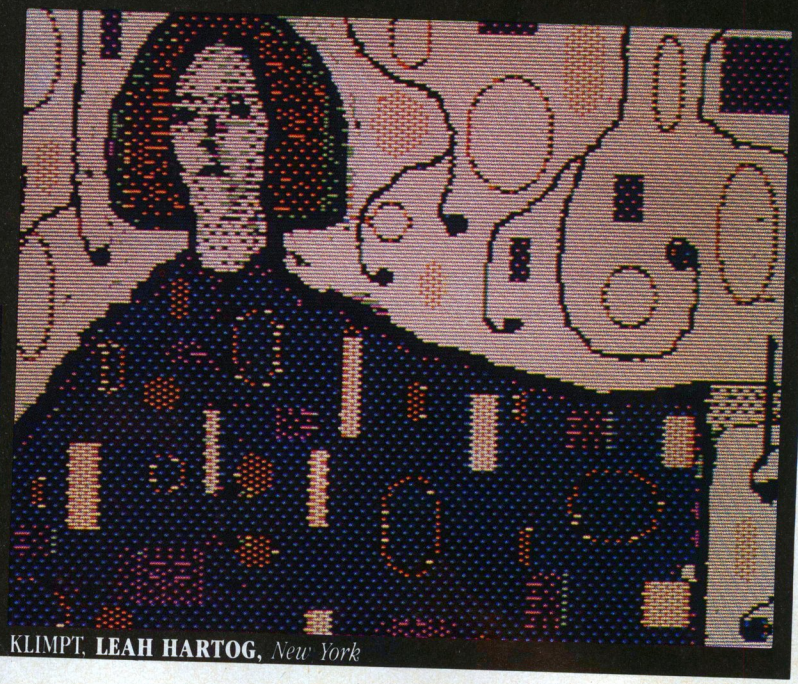


JAPAN, **LIZA WAI,** *New York*



COMPOSITION #1, **LIZA WAI,** *New York*



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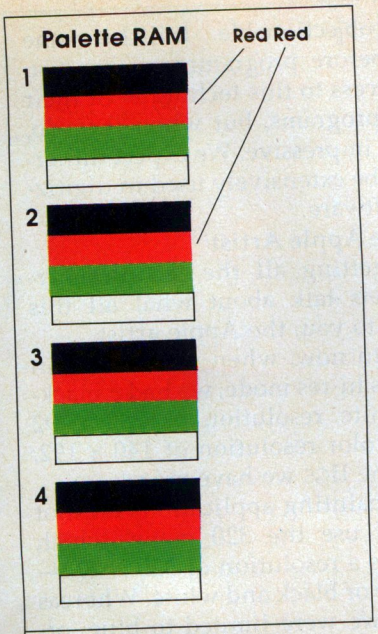

Figure 2: Each mini palette contains the same color values. The IIGS determines which mini palette to use from the pixel's position on the screen.

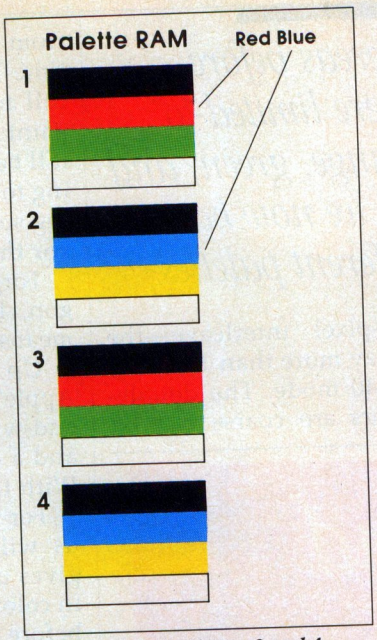

Figure 3: Mini palettes 2 and 4 are different from 1 and 3, resulting in automatic dithering. Pixels merge to produce a new color—in this example, violet.

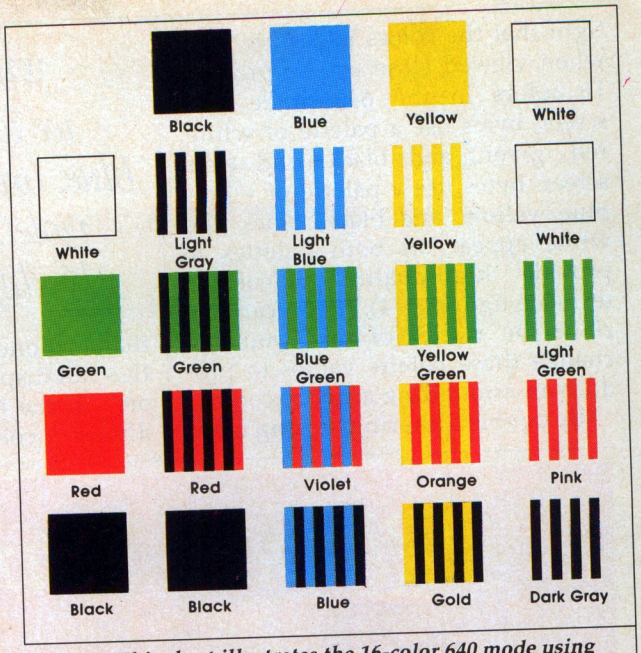

Figure 4: This chart illustrates the 16-color 640 mode using the palette shown in figures 2 and 3. By substituting different colors, you can generate an astounding array of different hues, and by double dithering, you can make the IIGS display more than 100 "colors" in the 640 mode.

the correct color by looking into the table for the pixel's bit combination. In the 320 mode, a pixel is generated for every adjacent 4 bits in the video memory map. In the 640 mode, a pixel is generated for every adjacent 2 bits in the video memory map. (Sixteen possible combinations of 4 bits provide 16 colors in the 320 mode; four possible combinations of 2 bits provide four colors in the 640 mode.)

By changing the numbers stored in palette RAM, you can change the colors produced. The total number of possible colors is 4096. This large number is because of the choice of analog RGB rather than digital (TTL) RGB. (See "The IIGS Shows Its Colors" in this issue.)

The palette area can contain 16 different palettes, and a different palette can be used for different scan lines, which means that in the 320 mode you can actually have 256 colors on-screen at once. You can use one palette at the top of the screen, another palette midway down the screen, and so on. Palettes can be changed on the fly, allowing for color cycle animation, which we'll discuss in a future column.

Color Mixing

Application programmers have several ways of determining what colors appear on the palette. (Foley and VanDam, in *Fundamentals of Interactive Computer Graphics*, [Published by Addison-Wesley, 1982] list five different methods.)

As an example of these alternatives, let's look at Baudville's 8/16 Paint program, which uses two different methods for mixing colors. Its Color option contains two sets of controls (see figure 1). One is labeled H, S, and I (hue, saturation, and intensity), and the other is labeled R, G, and B (red, green, and blue). Each set can generate all 4096 colors. To create a bright yellow, for example, you can slide the red and green controls to the same level and slide blue all the way off. Similarly, you can slide the saturation, the hue, and the intensity controls until the color is correct. Both methods accomplish the same thing. The red control selects both the amount and intensity of red in the mix. To brighten the yellow but maintain the same hue, you must slide both the red and the green controls equally. Or you can adjust only the intensity control, which has the effect of sliding both color controls. Baudville's Mike Darooge says that he likes to set up the initial palette with the HSI controls and then do fine-tuning with the RGB controls. Not all paint programs offer alternative methods for color mixing, but we like having a choice.

Palettes can be changed on the fly, allowing for color cycle animation.

If you're surprised that red and green make yellow, remember that you're working with light. The subtractive color mixing you may have learned with paints does not apply here. In additive color mixing, mixing equal intensities of the primary colors (red, green, and blue) results in white rather than black.

Dithering Magic

Because the 320 mode is the most colorful, most of the artists' tools we've seen work in this mode. The 640 mode offers some surprises, however. In hi-res or double-hi-res graphics, many programs offer dithered colors. Dithering is the placement of two or more pixels of different colors in close proximity. These pixels blend to a new color. You can, for example, generate a reddish tone in standard hi-res by mixing orange and violet. With dithering, the effective resolution drops, resulting in a coarse image because a unit of color consists of a group of pixels rather than a single pixel.

Apple IIGS engineers, when creating a demo program to show off the new computer, made an interesting discovery. With dithering, the IIGS can be coaxed into producing 16 colors in the 640 mode. The dither is so

tight that the colors look pure even when viewed close up. To produce 16 colors in the 640 mode, odd screen bytes use a palette of white, red, green, and black, and even screen bytes use a palette of white, blue, yellow, and black. Black and white appear on both palettes to provide high-quality, 80-column text (see figures 2–4). If you can sacrifice the clarity of text, you can change these palette values to produce an astounding array of colors.

By double dithering—using more than a one-pixel interleave—the IIGS can display more than 100 "colors" in the 640 mode. The double-dithered colors are coarse but far from objectionable. It'll be some time before programmers give you full access to this technique in their paint programs, but when they do, it'll be impressive. We expect dithering to be extensively used in digitizing software.

Whereas before we were limited to blue, orange, green, and violet, we now have 16 different palettes.

For the Apple Artist

Forgetting all the technical jargon, lets talk about what all this means to you, the Apple artist.

Up to now, when we worked in Apple's hi-res mode, we had a black-and-white resolution of 280 × 192 and a color resolution of 140 × 192. With the IIGS we have more!

For painting applications most of us will use the 320 mode, which gives us a resolution of 320 × 200—in color or black and white. Whereas before we were limited to blue, orange, green, and violet, we now have 16 different palettes. And the colors in these palettes are real colors. A red pixel, for example, can be plotted anywhere on the screen and can be put next to any other color without creating problems.

Because different palettes can be used for different scan lines, we can cleverly use up to 256 colors in one graphic. In a seascape drawing, for example, the top of the screen can use a palette with lots of reds and oranges for a sunset, and the bottom of the screen can use a palette of blues and greens for water.

Although we could do some simulated color shading on our Apple IIs by dithering the colors (black and blue pixels to create a dark blue), it was well nigh impossible to create the illusion of a three-dimensionally shaded object. Now we can use color-mixing options to create a whole range of shades for each color.

For drawing applications, mechanical drawing, CAD, charting, and so on, we have the 640 mode. In this mode, both palettes have black and white, so text will be as crisp and clear as the lines we draw. Higher resolution means fewer jaggies. Diagonal lines won't be perfect, but with four times the resolution we had before, we'll see a great improvement.

We've always been amazed by what you Apple artists have been able to achieve in spite of the color and resolution limitations of the II. We'd like to know what you think about the IIGS, and we're looking forward to seeing what you're doing with it—it should be dazzling. ✚

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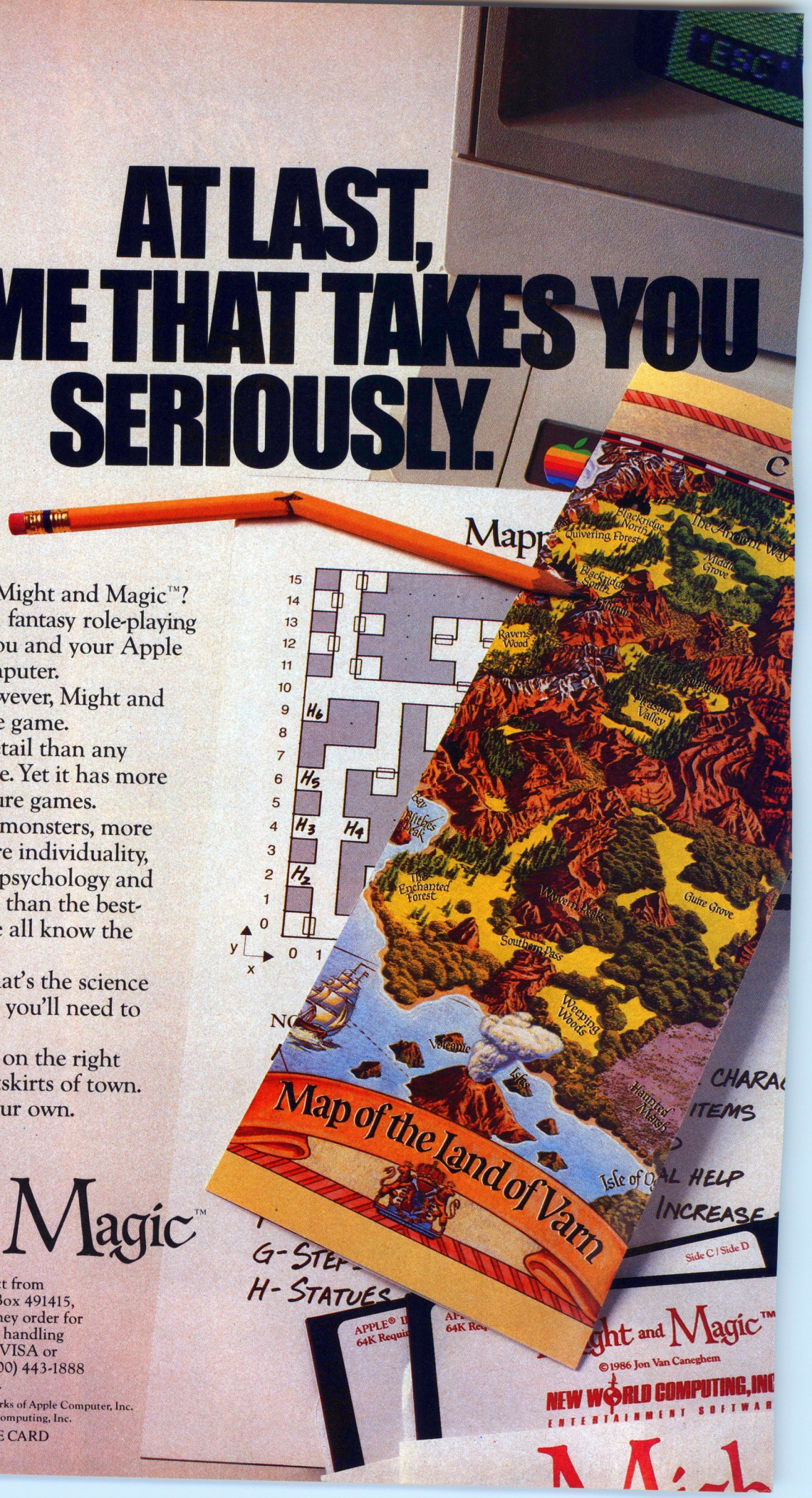

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CIRCLE 149 ON READER SERVICE CARD

GamePort

BY BOB LINDSTROM

Ace programmer Chris Crawford tells all about the latest version of his masterpiece of international geopolitics, Balance of Power

HOTHOUSE DIPLOMACY

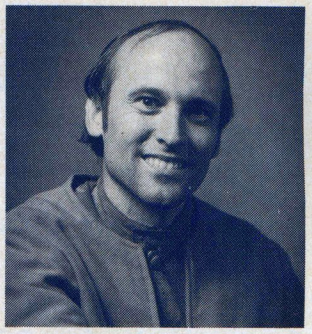
For players who want more out of a computer game than pumping a fire button, the best news of 1987 is the scheduled Apple II-series conversion of Balance of Power, a complex yet highly playable simulation of international geopolitics. In addition to being much more fun than a week in Reykjavik, Balance of Power is the masterpiece (so far) of acclaimed programmer Chris Crawford. Since the early 80s, Crawford has been recognized as the thinking person's game maker, beginning with his innovative war game Eastern Front. Before Eastern Front, computer war games weren't innovative, evocative simulations of military combat. They were electronic recreations of board games. In these hexagonal-hexadecimal worlds, pixilated blips replaced metal markers, and sketchy graphics imitated tabletop battlefields.

There were some advantages, though. Board war games required notebooks filled with statistics, ordnance strengths, morale points, and supply-line ratings. The computer versions allowed war-game fanatics to rely on their computer to do all the bookkeeping. Suddenly, even nonmathematicians could compete strategically with numerically minded living-room warriors.

And then came Crawford.

Eastern Front for the Atari 400/800 computer system revolutionized computer war gaming. The mechanics of a war game had never before been so transparent to the user. And when you were playing against the computer, your electronic opponent didn't wield its forces like a skinhead kid just out of ROTC. Here was a real general, a worthy combatant with genuine strategic smarts.

When Crawford, an educator turned game designer and programmer, turned to the Macintosh, the result was the remarkable Balance of Power, the first cold-war game. Its combative tools weren't tanks, infantries, and other weapons of military might. Balance of Power trained players in the suggestions, subversions, blusters, and covert threats of diplomatic combat. Instead of staring at a simulated battleground and calculating fields of view, Balance of Power players gazed at a world map, contemplating GNPs and terrorist activity.



"I'd wanted to do a game about the problem of war and peace for many, many years," Crawford explains. "If you look at the games I've designed, there is a rather clear, logical progression from focusing on the mechanics of war; to asking larger questions about how you win wars; to Balance of Power, which asks questions about how you use military power without getting into a war. In fact, Balance of Power asks, 'How do you use power in general—not just military power but economic and diplomatic

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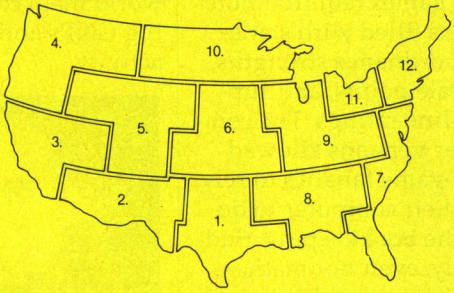

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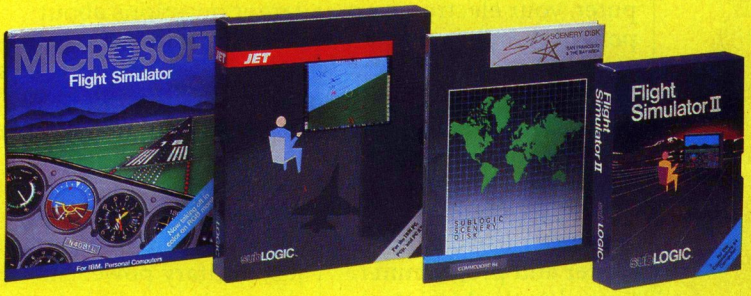

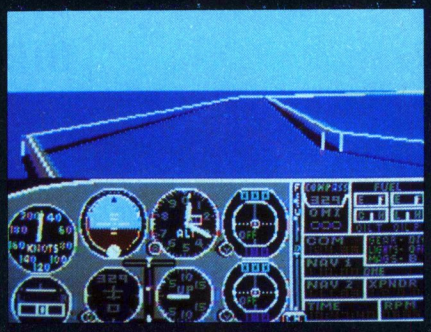

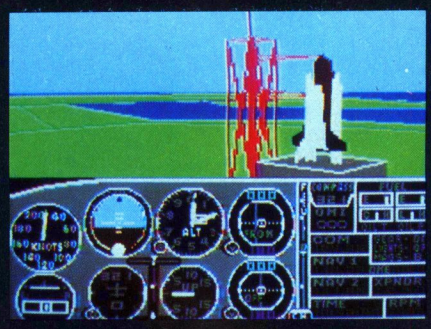

CIRCLE 110 ON READER SERVICE CARD

power—to accomplish policy goals without having everything blow up in your face?'"

In Balance of Power, an individual assumes leadership of either the United States or the Soviet Union with the intention of spreading his philosophies and influence around the world. Players have the ability to distribute financial and military aid, create treaties, fund insurrections, and generally threaten to make the other guys bite the big mushroom.

If a game ends tragically in worldwide nuclear war, Crawford reprimands the player with a text screen that notes, "We do not reward failure." To succeed in Balance of Power, players must learn to pound a fist without pushing the button. And although military force lingers dangerously in the background, it is not the focus of the game.

"The whole thrust of Balance of Power is to start you off with the emphasis on military power that most Americans accept and then waltz you down a primrose path away from that emphasis," Crawford says. One of the triumphs of Balance of Power is how skillfully Crawford leads that dance.

"This is highly charged political stuff, and Balance of Power in one way or another runs a very real risk of antagonizing people who have strong political beliefs. I chose to emphasize a power-politics view of the world. Yes, the game does have a very strong Chris Crawford stamp on it; but I tried to make that stand palatable to most players.

"The game is pretty evenly attacked by extremists on both sides of the political spectrum. Very staunch conservatives feel the game is a little too equivocal in its comparison of the United States and the Soviet Union. Basically, it doesn't take into consideration that 'We're the good guys, and they're the bad guys.' And they resent that. They feel that the game should reflect some fundamental superiority.

"And then, liberals object because it is straight, pure power politics, and they would rather anthropomorphize international relations and emphasize the goodness of spirit that is intrinsic in all human beings."

Crawford did not program the Apple II conversion of Balance of Power but closely supervised a revision of the Macintosh version of the game to accommodate the graphics and computing power of Apple II computers.

"We didn't take what we had and start chopping," Crawford notes. "I redesigned the map completely. I actually added a few countries, but I also took away quite a few. So it's been an extensive redesign."

After simulating the world of international geopolitics, what new project could be big enough to stimulate Crawford's imagination? Next time the context will be human communication and interpersonal relations.

"I'm now deep in the midst of a really weird game," Crawford reveals. "It's called Siboot (pronounced *See-boot*). It's very difficult to describe this game because I've

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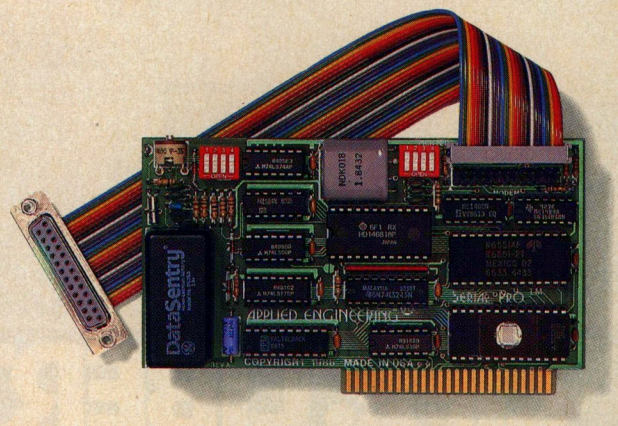

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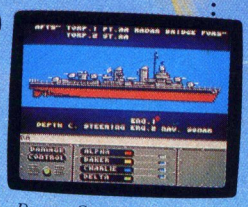
The time: 1400 hours. Somewhere in the Pacific. Some ill-fated coordinates in World War II.

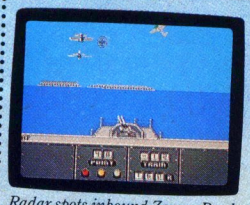


Damage Control reports a hit on the starboard side. Send in Alpha, Baker and Charlie to repair.

eyeball to eyeball action. This time around you'll be right in the middle of it all. You knew it wouldn't be pretty. But how tough could it be to rescue a downed pilot?

Will it be the twin 40mm Bofors anti-aircraft guns? Or the 5" lead-spewers aft? Depth charges or torpedoes? Autopilot or guts?

LIFE, LIBERTY AND THE HAPPINESS OF PURSUIT.



Radar spots inbound Zeroes. Ready forward gunnery positions. Man the anti-aircraft turrets. They're coming.

You're at the helm, commanding the greatest concentration of firepower ever put in a lightweight fighter. The deadly Fletcher Class Destroyer.

You've embarked on the first simulation that actually combines the intricate, large-scale strategy of wargaming with the intensity of furious,

It sure seemed a lot easier than shelling islands, escorting a convoy or hunting subs.

Or so you thought. But now look what you've got. Thirteen fully-operational, ear-bursting battle stations to worry about, all armed to the gills. Not to mention radar. Navigation. Sonar.

And half the Japanese fleet crawling up your spine.

Time to make some tactical decisions.

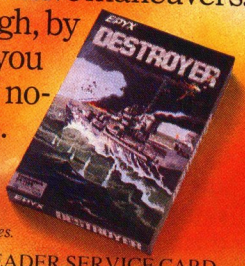
Any choice could be your last, so make it good.

Suddenly, you hear the ominous rumble of incoming Zeroes. You fire, and send one plummeting to the sea, trailing a plume of smoke.

On instinct, you instruct the bridge to commence evasive maneuvers.

Even though, by experience, you know there's nowhere to run.

YOU'VE ALWAYS DREAMED OF BEAUTIFUL MODELS. Now you can pick up an entire assault fleet, including a replica Fletcher Class Destroyer, from Revell. Or win an authentic scrambled eggs *flight deck cap. Sweepstakes details are in every box, or write for an entry coupon. No purchase necessary. Sweepstakes ends June 15, 1987. Official rules are available at participating dealers.*



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CIRCLE 144 ON READER SERVICE CARD

really gone out on a limb here. I wanted to blow open a lot of problems of game design. And so far I'm on track for achieving that.

"It has its own language that you have to learn to speak, and it's an iconic language. I've got the language operational now. And it's nice. You can sit around chatting away in this strange little language. It's got all sorts of strange things in it. It's a very strongly mentalist game. You engage in mind combat with other characters."

So, start developing those muscles between your ears, Crawford fans, and get those little gray cells in aerobic shape. Chris hopes to have Siboot ready in time for Christmas 1987.

In the meantime, check out the hothouse diplomacy of Balance of Power and try to keep the peace.

TO SIR-TECH WITH LOVE

One question lingers on the lips of Wizardy addicts the world over. Where is Wizardry IV: The Return of Werdna? Shortly after Legacy of Llylgamyn (Wizardry III) appeared, the talk began about yet another installment in this classic role-playing game series. Was it just talk?

"The talk isn't very loud right now," joked a Sir-Tech spokesperson. "But it is something the programmers are working on. We just don't have any schedule on it."

So don't stop feeding your pet dragon in protest over the delay, or you might find yourself left with a skinny salamander. Don't look for The Return of Werdna soon at your software dealer.

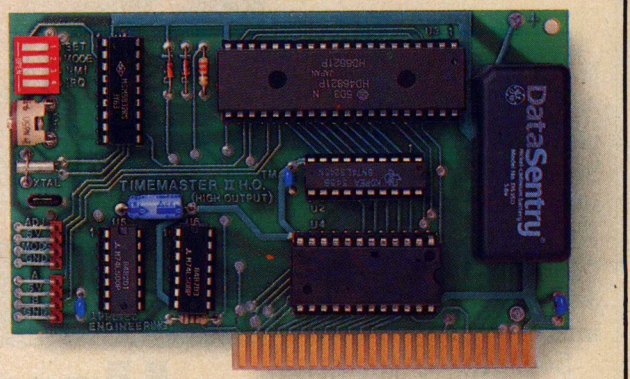
CHEATING THE MAD OVERLORD

I wasn't kidding when I sent out the cry for cheat techniques, uh, I mean game-playing tips, in the November GamePort. Tips on new games have been few in the intervening weeks. Either play testers are getting a lot sharper than they used to be (an Alarming Fact: today's cheater could become tomorrow's play tester), or the modern gamer plays strictly by the rules.

It looks like times have changed. "Sonny," exclaimed the sage old gamer, "In my day the first thing we'd do with a game was boot it and then start pressing every key combination possible. It's amazing how those control keys can uncover things the programmer never thought of." I guess unauthorized key punching is a fading technique, a sad comment on the Reagan era.

In any case, in lieu of a more up-to-date tip, Jim Ahn of Newark, Delaware, contributes a golden oldie for Sir-Tech's

The first clock card to add time and date to AppleWorks'™ screens and files.



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It's the smart way to put the time and date on your Apple IIe® or II+®. Because only the Timemaster H.O. packs *ALL* the important features of all the competition *combined,* including leap year, year (not just in PRO-DOS), month, date, day of week, hours, minutes, seconds and milliseconds. It's totally PRO-DOS, DOS 3.3, PASCAL and CP/M compatible. And, of course, it works better than any other clock with AppleWorks.

With the Timemaster H.O., you're assured of reliable, trouble-free operation along with simple, one-command time setting, accuracy through leap years, and a firmware maintained interrupt setting.

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• Time in hours, minutes, seconds and milliseconds; date with year, month, day of week and leap year • 24-hour military format or 12-hour AM/PM format • Eight software controlled interrupts so you can run two programs at the same time (many examples included) • Can be set to the second • Allows AppleWorks to time and date stamp all data automatically • Displays time and date on AppleWorks screens and files • Five-year warranty

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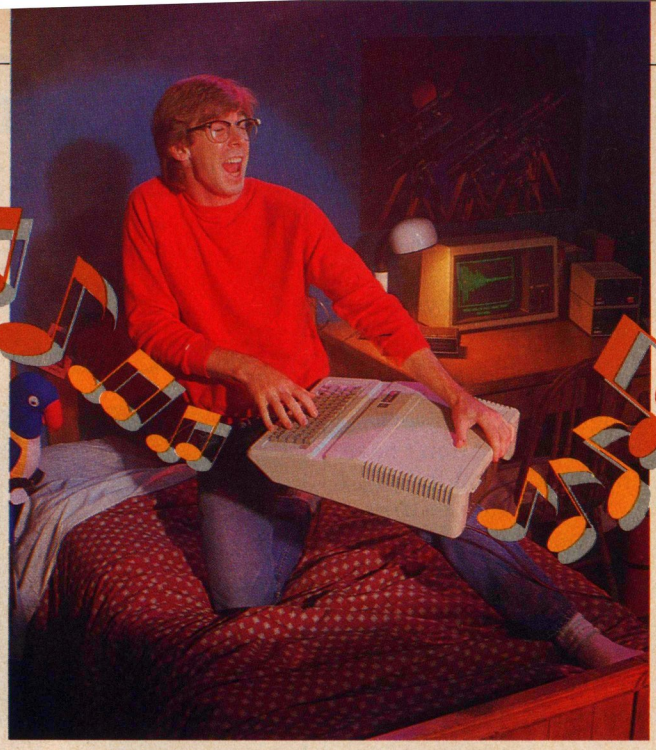

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SoundBuster breaks the sound barrier with high fidelity music that'll really shake your Apple's core. Sound quality that's so good, you can take it center-stage. In fact, a SoundBuster concert was recently staged in London without any additional musical instruments. A video is available upon request.

From good-time rock & roll to the boogie-woogie beat, you'll amaze your friends, your family and even yourself.

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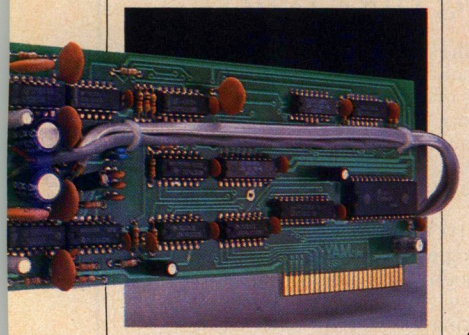
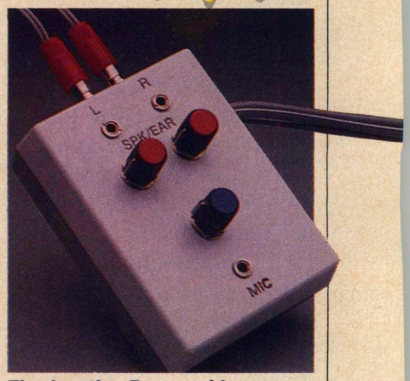


SoundBuster comes with the YES Card that fits into slot 2 of your Apple.



The Junction Box provides volume controls, speaker and microphone ports.

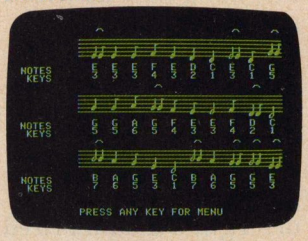
The SoundBuster System comes complete with:

- **The YES Card**
- **Junction Box** with volume controls, speaker and microphone ports
- **SoundBuster System Disk** with synthesizers, sampler, sequencer and wave editor
- **Sound Disk** with over 20 instrumental sounds, background rhythm tracks and sample tunes.
- ***Also included is a comprehensive User's Guide.***

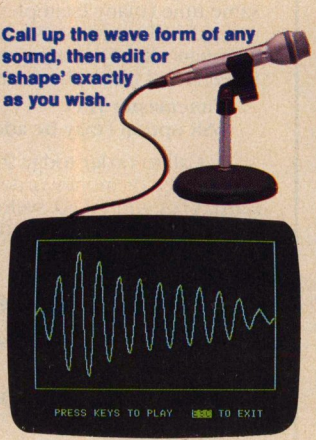
SoundBuster requires an Apple IIe or II+ with at least 48K memory and one disk drive.

SoundBuster connects to standard speakers or your stereo system.

Musical notation is displayed as keys are pressed, allowing the absolute beginner to look, listen and learn.



Call up the wave form of any sound, then edit or 'shape' exactly as you wish.



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CIRCLE 119 ON READER SERVICE CARD

Wizardry on Apple II computers.

"To give your bishop one million experience points instantly, go to the maze, go to camp, bring up your bishop, and identify number 9." And there's where the experimentation comes in because there are only eight Identify options.

"Some glitch in the game gives your bishop a million points, and from there you can go to the ahead with those bishops. But before you do, don't forget to send comments, opinions, and game-playing tips to GamePort, *A+* magazine, 11 Davis Drive, Belmont, CA 94002.

It's amazing how those control keys can uncover things the programmer never thought of.

Adventurer's Inn and make level after level. Your hit points skyrocket, and you learn all the spells in a flash."

I see that some of the sanctimonious among you are waving your fingers and clucking tongues in disapproval. Cheat? Me? Oh no, I couldn't. What's the matter? You don't think Wizardry: Proving Ground of the Mad Overlord is hard enough? Obviously, you've never brought a character along for six months only to lose him in a sudden ambush. It's OK, cheaters, you go right

THE MOMENT OF TRUTH

And now it's time for entertainment software to get its praise or just deserts from our crack *A+* reviewing team. Here are the games that are about to be analyzed for your amusement.

Mind Pursuit is Datasoft's contribution to the rapidly growing pile of computer trivia games. Shard of Spring finds Strategic Simulations adding tactical combat to computer role-playing games. The Coveted Mirror is another graphic adventure from Penguin Software. Finally, Elite is one of the first of a new breed: a cult computer game. This space-combat and trading program from Firebird has invaded Great Britain and large parts of the U.S. Some folks just can't get enough of it. Next thing, they'll be dressing up in bizarre costumes and playing it every Friday and Saturday at midnight. +

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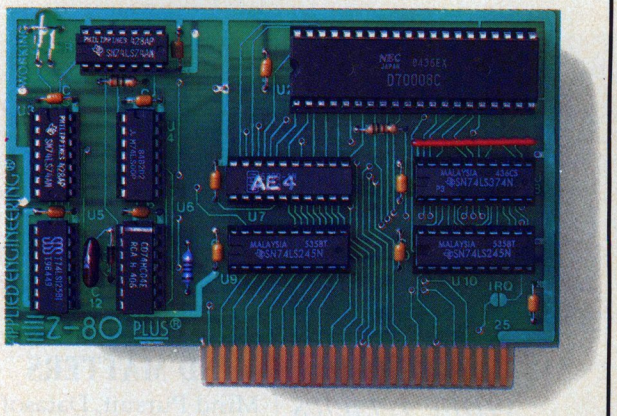

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The Z-80 Plus is the only card on the market capable of accessing more than 64K. If you have an extended 80-column card, all 128K is usable. And if you have RamWorks, RamFactor, GSRam, GSRam Plus, or an Apple memory card in your IIe, IIGS or II+, up to 1088K is available.

Each Z-80 Plus comes with our CP/M Ram Drive software, enabling most memory cards to work as a high-speed Ram disk so CP/M software can run up to *twenty times faster.* So packages like WordStar, dBASE II, Turbo Pascal and most others run at blinding speed.

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Reviews

This month's game reviews bring you brain teasers, a magical missing crystal shard, a broken enchanted mirror, and space adventure through eight galaxies.

MIND MATTERS

Mind Pursuit, Datasoft's new quiz game for the whole family, meets the growing national craving for knowledge and nostalgia. It offers three types of question with increasing point ratings (true/false, 25 points; multiple choice, 50 points; fill in the blank, 100 points) in six different categories: Science and Nature, History and Geography, TV and Film, Sports and Games, Culture, and Grab Bag. Typical questions are "Who is known as The Father of Medicine?", "What do you examine with an otoscope?", "In Law, a spoken lie under oath is called what?", and "The maximum weight of a ball in tenpin bowling is how many pounds?".

The game is designed for 1–4 players or teams. At the beginning of your turn, a flashing "die" on the computer screen determines your question category. If you answer a question incorrectly, you lose that question's point value from your score. There are thousands of questions, and you can purchase an additional question disk separately. On repeat play, some of the same questions pop up—but this happens in most trivia games.

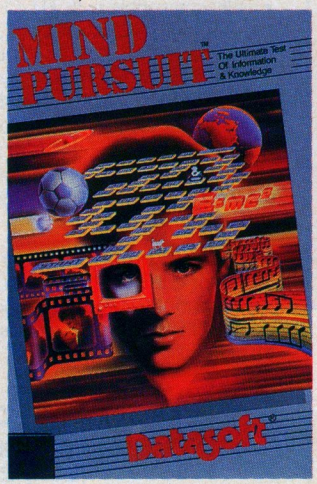
You can also play in board-game style. In this mode, the screen shows numbered squares on which you move in response to correct answers. Higher-point-value questions earn you greater progress on the "board." Shortcut options and bonus flashing squares add variety to play.

When you start the game, you can preset the time allowed for answering questions (30, 45, or 60 seconds), or you can play without using the timer. Having a time limit is nice if you get bored waiting for others to give their answers.

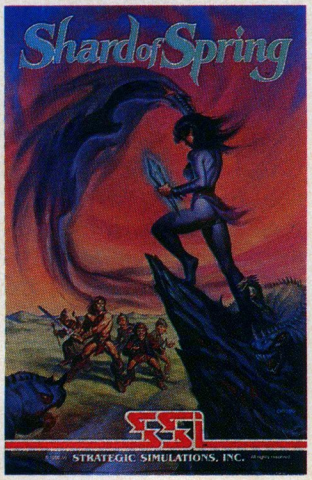
It may be unfair to compare this software to a mere board game such as Trivial Pursuit, but I can't resist. One of Mind Pursuit's advantages is that musical and/or graphical clues accompany some questions—something Trivial Pursuit can't do. Mind Pursuit also keeps score automatically. I found the question categories in Mind Pursuit

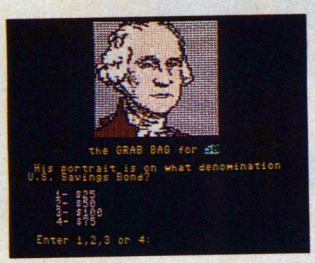
less rigid than those in Trivial Pursuit. In Trivial Pursuit, for instance, a sports buff may have an edge over other players because sport is a specialized topic not everyone shares. Mind Pursuit, however, has sports and games wedded in a single category, so there's a bit more leeway. Also, you're not required to answer questions from *all* categories as you are in Trivial

MIND PURSUIT
Datasoft, Inc.



SHARD OF SPRING
Strategic Simulations, Inc.





Pursuit—you can play the game out without answering in some areas.

If you've got the impression that I like Mind Pursuit, you're right. It's a great cranial teaser for all ages.

John DiPrete

MIND PURSUIT
Datasoft, Inc.
19808 Nordhoff Place
Chatsworth, CA 91311
(818) 886-5922
LIST PRICE: *$29.95*
REQUIRES: *Apple II Plus, IIe, IIc, or IIGS; 64K RAM; one disk drive*
CIRCLE READER SERVICE NO. **400**

SHARD OF SPRING

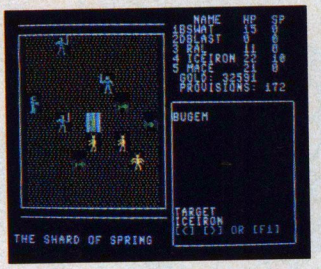
My most exciting hours in graduate school were spent exploring an ancient pyramid on the planet of Tekumel. Recently, Shard of Spring took me on a similar journey to the island of Ymros. In this fantasy/role-playing adventure game, you are searching for—you guessed it—a magical crystal shard. It's been stolen by an evil sorceress, and your mission is to join other adventurers to recover it.

You and your fellows march through the wilderness, fighting monsters, searching through dungeons, and piecing together clues you find or overhear in the taverns. Along the way you acquire gold and other items (if you're lucky). Shard of Spring has all the elements role-playing gamers know and love, plus graphics and some nice refinements.

You begin Shard of Spring by forming a party of 1–5 adventurers. These adventurers are either warriors or wizards, chosen from five races: human, elf, dwarf, gnome, and troll (why are humans always the tallest good guys in these games?). All characters have individual traits and skills that determine what they can do and how well they can do it. Traits include speed, attack skill, endurance, intellect, and strength.

Your quest begins outdoors. The screen shows a colorful map of your position on a 9 × 9 grid, and windows show the status of your characters and let you enter commands. As you wander through forests, swamps, plains, and mountains, you may encounter towns, dungeons, and monsters.

When you encounter a monster, the screen changes to an enlargement of the square you are in. Now each character and monster is shown individually. You can move, strike, or cast a spell by issuing simple commands. Dungeons also have this enlarged combat feature, and the graphics are very good.



Be sure to map the corridors and contents of the dungeons as you go.

Towns are good places to be. You can buy weapons and armor, get healed (or maybe even resurrected), sleep to regain your strength, or chat with other adventurers. Who knows which bits of gossip will ultimately lead you to the shard?

Periodically you can set up camp to equip your players with weapons, identify things you have picked up (maybe), sleep, or print out the current status of each character. As with other activities in Shard of Spring, you select these options from a menu with single keystrokes. The computer responds rapidly to keep the tempo of the game lively.

Shard of Spring contains many features that will keep you from mastering it too quickly. Magic spells are one example. There are some 24 different spells, grouped into fire, metal, wind, ice, and spirit runes. Only very experienced wizards can use many of these, so you'll have to play for quite a while to encounter everything the game has to offer. The areas to be explored are very large, also, but they are populated enough to stay interesting. One of my few complaints is that encountering too many monsters at once can get boring.

Both beginning and experienced fantasy/role-playing enthusiasts will enjoy Shard of Spring. If you rate your entertainment software by dollars per hour played, this is a bargain.

Karl E. Wiegers

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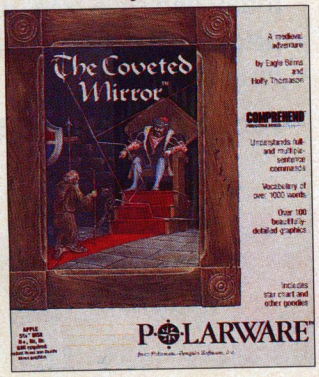

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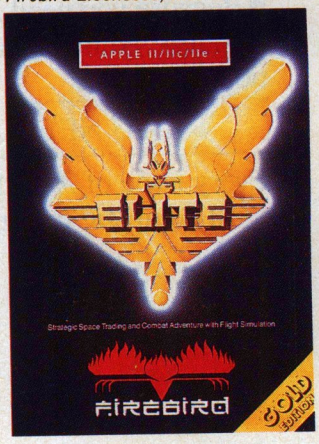

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REFLECTIVE RESTORATION

For many years, Munjistan's mirror was an instrument of justice and peace. But one day the power-hungry Voar crept in and stole it, hoping to use it for his own evil purposes. As he fled, he broke the mirror into five pieces, escaping with only four of them. Munjistan took the fifth piece and cast a spell on it to hide it. To defeat Voar, someone must reassemble the five shards.

So begins The Coveted Mirror, a new adventure game from Polarware/Penguin Software. Actually, the game is more of a puzzle than an adventure—there's no violence, and nothing *really* bad happens if you lose. To win, "all" you have to do is master a complicated series of trades and shortcuts.

The authors, Eagle Berns and Holly Thomason, have filled out their puzzle with a host of entertaining characters and locations. In one direction there's the inevitable prison tower and its adjoining maze of corridors. In the other direction there's a thriving medieval town filled with merchants, peasants, priests, and animals. Beyond the town, things take a mystical turn. There's a magic horse, a secret ring, and a mysterious door; beyond the door lies still another world, this one hidden by the Impenetrable Mist. All the characters like to give clues, and most of them respond to a quick wit and a good barter. (Some of them respond to bribes, too.)

The game has many considerate touches. You can save three versions, which helps if you like to cheat. At any point you can bypass the graphics by shifting into the text mode. You can speed the entry of commands by stringing them together with commas. If you suffer from occasional amnesia, the Inventory command lists your booty, and a Help command lists the other commands. An ever-present hourglass helps you keep track of the time.

The graphics are colorful and detailed. They aren't really animated, but the program does use an "overlay" technique that places a variety of figures against a static background. When you come into the town square, for example, the buildings are always the same, but you often meet a different person—a knight on horseback, or Toby Troublesome, or Granny Garbled-Marbles. Doors and windows open or close as you instruct, and objects that you take leave the picture.

Thanks to Polarware's Comprehend system, you can use full English sentences to manipulate characters. You do have to exercise special care in spelling things out—for instance, the thief can't help you much if you forget to open the stocks after you pick the lock.

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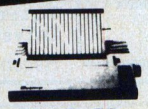

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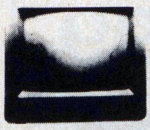

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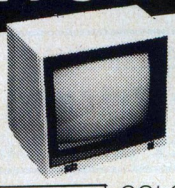

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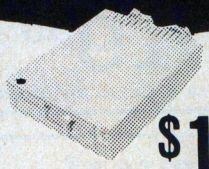

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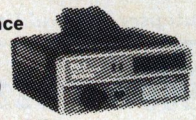

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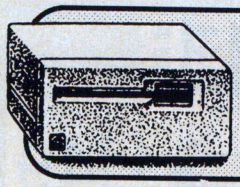

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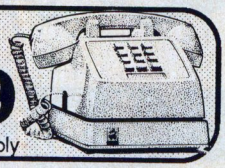

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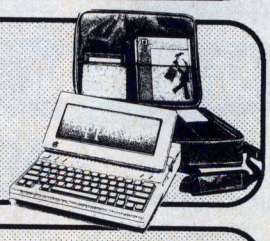

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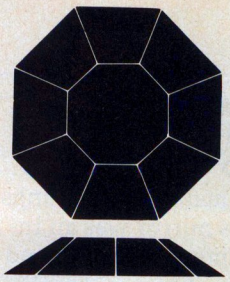
CELESTIAL CAREER LADDER

As I sit here in the cockpit of my Cobra MK III spacecraft, I see the planet Lave coming up on my scanners. I haven't been back here in a while, and the big white ball on the view screen brings back memories of when it all began.

I was a green space jockey. My rating was Harmless, my police record Clean. My ship? The same Cobra MK III, but without the special equipment I have since added. I had one front pulse laser, shields, four missiles, and a 20-ton cargo bay. The cockpit looked the same then as now. Besides the main view screen, there was the familiar flight-grid scanner that showed ships and other objects in three-dimensional space. Then there were the gauges—forward and aft shields, four energy banks, hyperspace fuel, laser temperature, cabin temperature, altitude, gyros, and the all-important compass that always led me true to the planet or space station nearest



THARGOID INVASION SHIPS

me. I had 100 credits to my name, and I intended to make my fortune as a space trader.

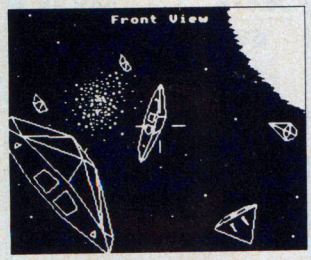
A hundred credits won't buy you diddley in that part of space, so I had to start small. I bought food and textiles on agricultural planets such as Lave and sold them at industrial planets. What a feeling! Eight whole galaxies, each with hundreds of planets to visit, alien life-forms to trade with, profits to make.

Not to mention the glory. There's a bounty on space pirates and Thargoid invasion ships. Of course, you have to kill them before they kill you. I remember studying the space manual, thick with detailed descriptions of expensive equipment I couldn't yet afford, pictures and data on the many common space-going vehicles, and hints for the novice trader on how to get along with aliens and different governments. I learned to stay away from planets whose governments were in Anarchy. Anarchy planets always had too many pirates hanging around to handle with pulse lasers and just a few missiles.

As soon as I could, I bought a docking computer. I had crashed many times trying to master the tricky rotating entrance to the Coriolis space stations where all trading took place. Lucky my resurrection file was kept up to date in the master com-

puter. Dying these days needn't be permanent, just inconvenient.

After the docking computer and the extra cargo bay (it holds another 15 tons), I bought some beam lasers, front and rear. They were better than the pulse lasers, but I still had my eye on the costly military lasers. I made do with beams for a



while and bought some other items—a fuel scoop to pick up stray cargo and fuel from the sun, and an EEU (Extra Energy Unit) to make my shields charge up faster. An ECM (antimissile system) was essential for avoiding enemy missiles. I also got a one-time energy bomb that could wipe out a whole armada in dire emergencies and an escape pod for those even more dire situations. The escape pod let me keep my money, and insurance supplied me with a fresh ship. I lost the cargo, but I also lost my police record. That came in handy when, to make a buck, I tried trade in guns, slaves, and narcotics. I became a Fugitive, and life became much more difficult. I decided to stay clean after that.

When I finally was able to equip my MK III with military lasers, I became a most daring adventurer. I used to hang out in space near the Anarchy planets just waiting for Thargoids and other low-life scum to try to attack. I liked letting them come close, studying their three-dimensional wire-frame images as they appeared on one of my four view screens. I made short work of them all. By now my rating had climbed from Harmless to Mostly Harmless, then to Competent.

Just as I was beginning to wonder if this was all there was to it, I got a message from the Space Navy. They wanted me to perform a dangerous mission! Well, that's a long story, and it's classified anyway. And then there are the other missions, classified all. So what am I telling you for? I'm the Elite. You'll have to find out for yourself. Just remember, when you think you have it all figured out, beware. Something unexpected and unseen might cut you down to size.

Hey, you want some advice? Study your manual, perfect your maneuvers, and buy low/sell high. And don't take any wooden lasers or trust a blue bug-eyed lobster with his claws behind his back. You'll make Elite. Sure you will . . .

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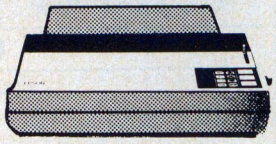

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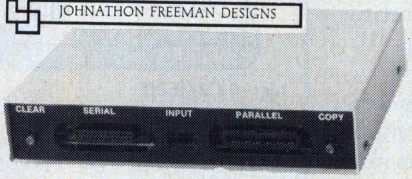

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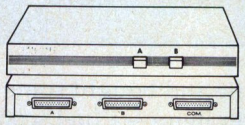

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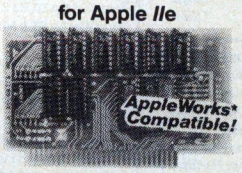

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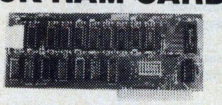

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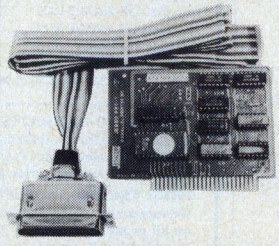

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CIRCLE 279 ON READER SERVICE CARD

BY MICHAEL WIESENBERG

SEARCHING FOR RATIONAL SOLUTIONS

Find the two other numbers whose cubes add up to 9

The numbers *1* and *2*, when cubed and added together, produce the number *9*. Can you find two *other* positive rational numbers whose cubes also add up to 9? Hints: Both numbers are obviously fractions; $\sqrt[3]{4}$ and $\sqrt[3]{5}$ are not solutions because they are not *rational* numbers. You cannot solve this problem using real numbers—at least those that are part of the common programming languages found on microcomputers—to compute these fractions because they do not hold enough precision for some of the steps in the computation. This puzzle has a *precise* answer. If you use integers to find numerators and denominators, your computer will not be able to handle numbers large enough to solve the problem.

Send me a complete program that solves the puzzle. Please include output and running time. If you send a disk, please also enclose hard copy. Your program must be short (you can see approximately *how* short by the listing of this month's winner), elegant, and self-documenting. The best solution wins a one-year subscription (or extension) to *A+* and a Certificate of Excellence in Programming and will be published here.

Send all entries, which must be received by February 10, 1987, to Computer Calisthenics, Box 2329, Stanford, CA 94305. All entries become the property of this column's author, who will select the winner and whose decision is final. The winning program will be announced in the May 1987 issue of *A+* magazine.

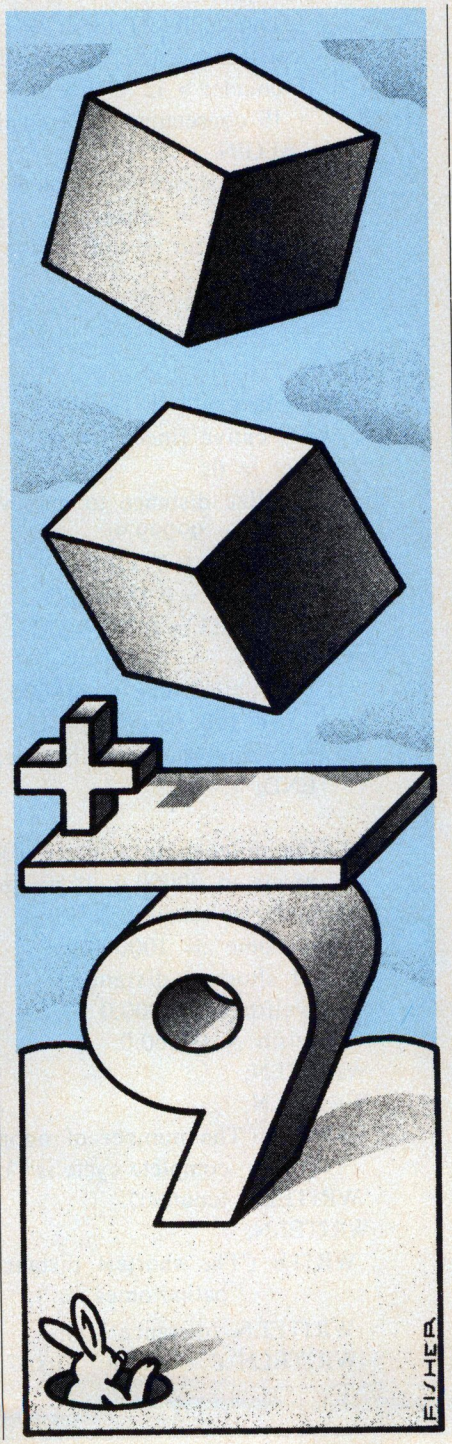


ILLUSTRATION BY MARK FISHER

Answer to November's Puzzle

November's puzzle requested a program that found all palindromic occurrences in one complete cycle through a car's odometer (those that can be expressed algebraically as *xyzzy.x* (with *x*, *y*, and *z* possibly but not necessarily being all different integers). It also asked you to find the shortest trip (from where to where on the odometer, in miles) to contain 12 such numbers.

A program that checks for odometer palindromes must include 00000.0 in its reckoning. This is the only number that occurs *twice* in one complete cycle because, of course, a trip could either start at 00000.0 or end there. Also, I specified "one complete cycle through the odometer." By that I meant once through from the all 0s when you first enter the car as it leaves the assembly line to that same palindrome once again, just as the odometer finally rolls over a tenth of a mile after reading 99999.9—not any other 999,999 cycles (as, say, from 11111.1 back to 11111.0).

In such a trip, then, you don't need a computer to figure how many total palindromes there are. Because every instance of the first digit determines the sixth, every instance of the second determines the fifth, and every instance of the third determines the fourth, and because you can have any of ten digits in each position (0 through 9), the answer is simply $10 \times 10 \times 10$ *plus 1*.

For which is the shortest trip to produce 12 palindromes, a lot of people said there were 18 such, each of 1002.1 miles. Three examples of these are 08998.0 to 10000.1, 09999.0 to 11001.1, and 8999.8 to 91001.9. I asked, however, for the *shortest* trip, which certainly implies one only, not 18. That trip is the 1001.1 miles

from 98998.9 to 00000.0.

Peter Rokitski of Detroit gets an honorable mention for his Applesoft BASIC program. Peter also correctly states that if "rollovers" are permitted, a second occurrence of a 1001.1 mile trip containing 12 palindromes is from 9999.9 to 01001.0 and comments, "but that is not completed during one cycle."

Marvin Barnes of Clemmons, North Carolina, gets the prize for a Pascal program that produces an answer (depending on your machine) in seconds. When run, the program prints:

```
The number of odometer palindromes in one
complete cycle is: 1001
The shortest distance containing twelve
palindromes is: 1001.1
from: 98998.9 to 0.0
```

Notice the clever way Barnes constructs a palindrome, as shown in this statement:

```
palindrome := (10000.1 * digit1) + (1001
*digit2) + 110 *digit3;
```

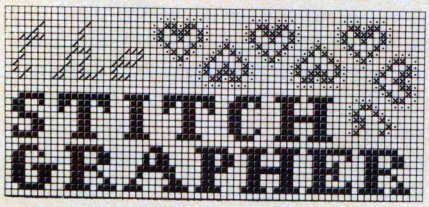
The routine find_shortest_distance always assigns the shortest distance found so far to the variable distance, with the start of that trip stored in first and its end in twelfth. ✚

NOVEMBER'S WINNING PROGRAM

```
PROGRAM odometer;
{ An odometer palindrome is represented as:
    digit1 digit2 digit3 digit3 digit2 . digit1
  One odometer cycle is from 00000.0 to 00000.0 }
 VAR
  digit1, digit2, digit3, index, counter : INTEGER;
  first, twelfth, distance, palindrome    : REAL;
 consecutive                          : ARRAY [1..12] OF REAL;
  PROCEDURE find_shortest_distance;
  BEGIN
     { Count the odometer palindromes }
    counter :=counter + 1;
   FOR index := 1 to 11 DO
      consecutive [index] := consecutive [index + 1];
    consecutive [12] := palindrome;
   IF counter > 11 THEN
     IF consecutive [12] - consecutive [1] < distance THEN
    BEGIN
        distance := consecutive [12] - consecutive [1];
       first := consecutive [1];
       twelfth := consecutive [12];
    END;
  END;

BEGIN
  FOR index := 1 to 12 DO
    consecutive [index] := 0;
  counter := 0;
  { Initialize distance to max value }
  distance := 99999.9;
 FOR digit1 := 0 TO 9 DO
   FOR digit2 := 0 TO 9 DO
     FOR digit3 := 0 TO 9 DO
     BEGIN
         palindrome := (10000.1 * digit1) + (1001 *digit2)
        + 110 *digit3;
         find_shortest_distance;
     END;

  { The mileage is actually 100000.0 when the odometer
    resets to 00000.0. If we get that value, reset to actual
    odometer reading. }
  palindrome := 100000.0;
   find_shortest_distance;
 IF twelfth = 100000.0 THEN
   twelfth := 00000.0;
 WRITELN;
 WRITELN;
  WRITE ('The number of odometer palindromes in one
          complete cycle is: ');
 WRITELN (counter);
 WRITELN;
  WRITE ('The shortest distance containing twelve
          palindromes is: ');
  WRITELN (distance:3:1);
  WRITELN ('     from: ',first:7:1,'    to: ',twelfth:7:1);
END.
```

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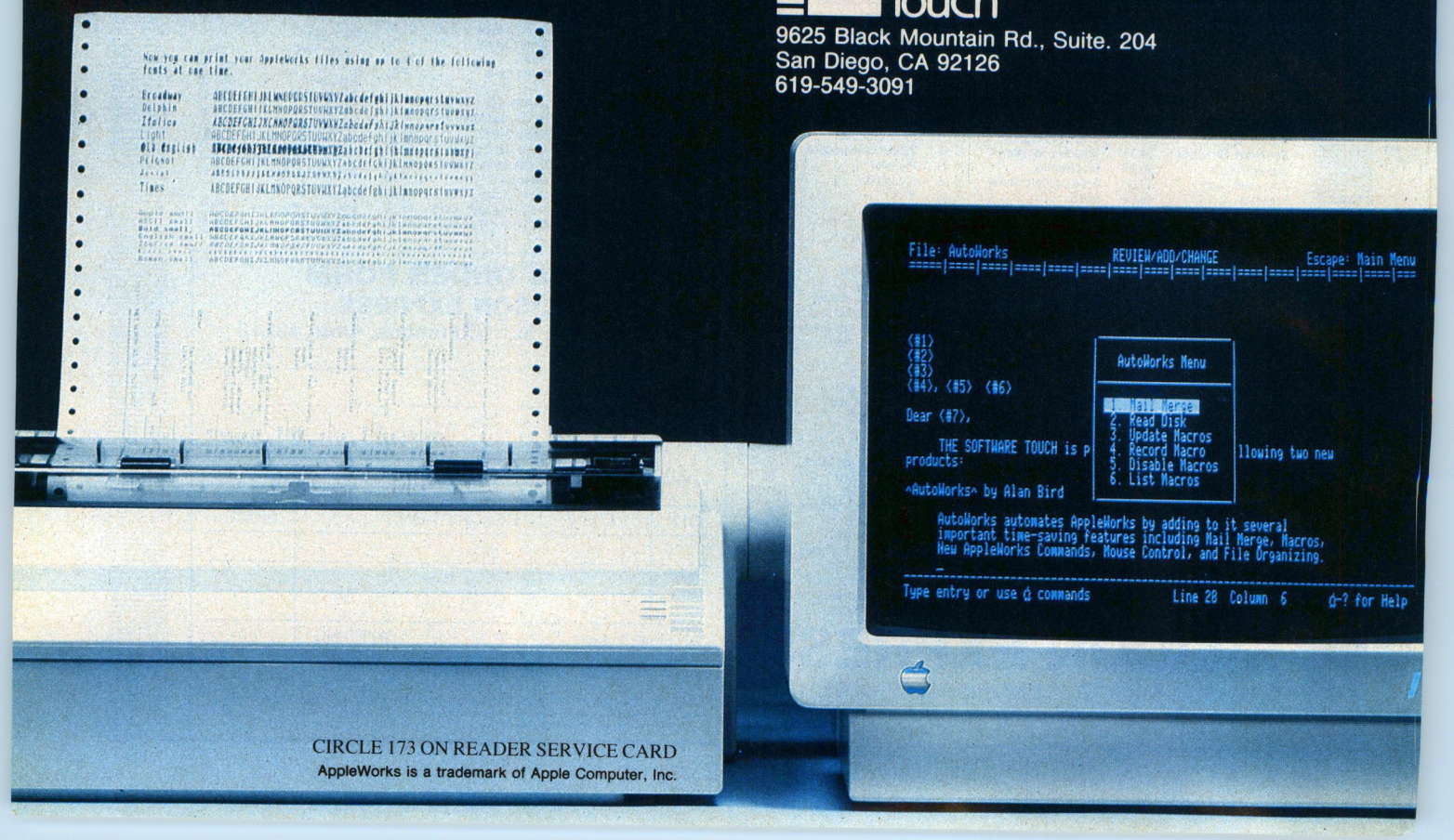

CIRCLE 173 ON READER SERVICE CARD

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BY RUSS LOCKWOOD

ON-LINE ORACLE FOR THE NEW YEAR

Telecommunications predictions for '87, BBS news, and teletips

In ancient times, the art of prognostication consisted of examining animal entrails, casting runes, and watching the flight path of birds. As you can imagine, the results were rather erratic.

The funny thing is that, even in this time of high-tech telecommunications, the accuracy of predicting the course of the personal-computer industry can be just as erratic. For example, in the April 1986 issue, I predicted we could all expect junk E-mail. Well, I haven't received any yet—and don't look forward to it either.

On the other hand, I said you would be filing your federal tax returns electronically and was right on the money. The IRS processed more than 25,000 such returns in 1986.

As for the rest of the predictions, they fell somewhere in between. But I'll take another stab at it and log onto my crystal ball to offer some predictions on telecommunications for 1987.

Vision '87

• **Electronic Tax Returns.** Wait a second, didn't I just say that was a pick for '86? Yes, I did, but this time around, the IRS has taken the pilot program and made it more attractive. The agency recently announced that businesses anywhere in the country can file their tax returns electronically. Also, individuals in seven areas of the country—Albany, New York; Cinncinnati, Ohio; Milwaukee, Wisconsin; Norfolk, Virginia; Phoenix, Arizona; Raleigh, North Carolina; and Sacramento, California—will also be able to file electronically. Finally, electronic filers can receive an electronic refund by identifying their bank. Check with your local IRS office for more details.

• **Faster Modems for Less.** Faster modems, such as 2400-bps modems, are in a catch-22 situation: people won't buy them because of the high cost and lack of services, yet prices won't fall and services won't change until people buy more of them. Right now, according to Dataquest of San Jose, California, the modem market breaks down like this:

1200 bps	78%
2400 bps	9%
9600 bps	1%
Other	12%

Look for this cycle to break in 1987. Businesses will lead the way, as they look for ways to transmit documents quickly. The 2400-bps market, after it gets rid of the misconception that these modems cause more transmission errors than 1200-bps modems, will expand dramatically. The 4800-bps modem will be bypassed in favor of the 9600-bps modem, but do not expect either of these high-speed modems to gain general consumer acceptance—you can buy an entire Apple IIGS system with peripherals for the price of one such high-speed modem.

Businesses anywhere in the country can file their tax returns electronically.

• **Electronic Distribution.** Often, software upgrades are more trouble than they are worth. Mailing an extra disk and manual costs time and effort for both the vendor and the consumer. How much easier it

ILLUSTRATION BY PAUL YALOWITZ

would be to download code and documentation directly onto a program disk. In the IBM world, Lotus is just starting to offer electronic distribution to corporate "site licensees." So far, Exxon and others have accepted. If Lotus finds such an arrangement cost-effective, you can bet that this idea will spread to other software vendors.

• **ISDN.** The Integrated System Digital Network may be a solution in search of a problem. It replaces the analog telephone system with a digital system, theoretically eliminating the need for a modem (although you would still need a hardware device of some sort to access the network). Its capabilities are impressive, but modem technology tarnishes some of the glitter. Nevertheless, Pacific Bell recently declared its pilot program—Macs hooked into an on-line network—a success and plans to start commercial service later this year. IBM evidently agreed, for it has filed a complaint with the FCC claiming Pacific Bell is in violation of the AT&T divestiture agreement because the network includes a certain type of equipment that Pacific Bell should not be permitted to operate. Stay tuned for round 2.

• **Junk E-Mail.** Oh, I know I picked this for '86, but I figure if I keep choosing it, sooner or later, for better or worse, it will become a reality.

For Whom the Carrier Tone Polls

No electronic augury is complete without a look at bulletin board systems (BBSs). System operators are generally ahead of their time, for they are living the telecommunications revolution instead of reading about it. A BBS vendor in Sunnyvale, California, called e-Soft has released the results of its poll of almost 200 BBS operators. The company found that

Systems operators are living the telecommunications revolution instead of reading about it.

• 93% of those surveyed have upload/download capability
• 67% do not charge for access
• 33% use 2400-bps modems
• the average system receives 45 calls a day

It seems that 2400-bps modems are starting to become popular with the BBS set. I only wonder if the 33% who own 2400-bps modems are the same 33% who charge for their BBS.

W/PUG BBS

The Word Processing Users' Group, established in 1985, has started a BBS called SCROLL for users of word-processing software. Reviews, tutorials, public-domain programs, and more are available. Annual membership is $25.

TELETIPS

Here's a look at news, views, and breakthroughs in the telecommunications world.

New Products

PBI Software has released Version 1.3 of its terrific telecommunications program CommWorks. Among the upgraded features are XMODEM transmission of ProDOS system files, more powerful macros, the ability to exclude or include control characters when downloading a file, increased ability to work with interface cards, and more protection against accidental deletion of data in

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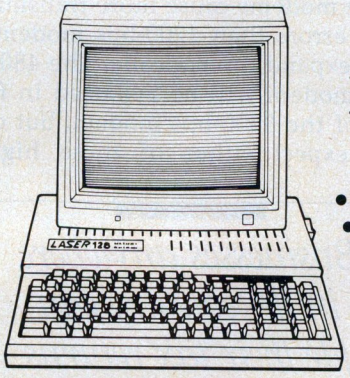

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With Monitor, Printer, 2nd Disk Drive & Cables	$1,136	$825

Laser 128 is the Apple IIe compatible computer that brings you the best of all worlds. Transportable like the IIc, expandable like the IIe, but priced like a Commodore 128. *A+ Magazine* calls **Laser 128** the 'clear winner' of Apple compatible computers.

For Apple II & Laser 128

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ORANGE MICRO Grappler for II+/c	$119	$79
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MODEMS		
CONROY•LAPOINTE 1200 External w/Software	$299	$179

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the capture buffer. Also, an optional VT-100 emulation module is available. A review of CommWorks, Version 1.2, appeared in the October 1986 issue of *A+*. If you are looking for a telecommunications program, take a close look at CommWorks—Version 1.2 is a first-rate program, and Version 1.3 is even better.

Cellular Interface

For all you upscale readers out there, Morrison & Dempsey Communications has introduced a $399 AB1X interface for cellular telephones. It provides all the features of a standard telephone line that you don't usually find in an average car. If you own a cellular telephone and a IIc (or other laptop computer for that matter), this device may prove to be valuable.

Dark Side of the Modem

The Associated Press has reported that a hacker who goes by the name of Pink Floyd has broken into dozens of computers at universities and businesses around the country. None of his targets has reported any damage, although Pink Floyd has made subtle alterations to some systems to make detecting his intrusions more difficult. Among the targets: Stanford University, Lawrence Berkeley Laboratory, Massachusetts Institute of Technology, University of Illinois, Mitre Corporation, and at least three Silicon Valley companies.

Outhacking the Hacker

The Electronic Mail Association (EMA) has released a brochure detailing methods of protecting your E-mail from prying eyes. Among the tips: Create levels of access on the E-mail system, use a common encryption program, and use esoteric passwords. Write to the EMA for a free brochure.

Telecommunications makes the world smaller all the time. Someday we'll have a commercial link to Europe.

When Visions Collide

The Information Industry Association (IIA) is scheduled to publish a study in February detailing how new information systems will affect mankind between now and the year 2000. The study, undertaken by the Institute for Alternative Futures and funded by Dun & Bradstreet Corporation and Pacific Telesis Group, is entitled "The Information Business of the Future: A Strategic Planning Process."

According to IIA president Paul Zurkowski, the study attempts to "provide an independent and objective analysis of the issues facing government and industry; provide strategic information that companies can use in developing new products and new markets; and serve to initiate a continuous dialogue among individuals, industry, and government on critical issues."

International Connections

Reader Ed Gilchrist notes that the French government has installed more than two million videotex terminals within the country. That's a lot of people on one system. CompuServe and MCI Mail boast approximately 500,000 subscribers combined. Nice numbers, but, yawn, so what?

Well, you already know you can send E-mail from CompuServe to MCI Mail and vice versa. What you

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- Manual contains sample applications

A/D SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- Fast conversion (.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, −5 to +5, −2.5 to +2.5, −5 to 0, −10 to 0.

The A/D process takes place on a continuous, channel sequencing basis. Data is automatically transferred to its proper location in the on-board RAM. No A/D converter could be easier to use.

D/A SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- On-board output buffer amps can drive 5 MA
- D/A process is totally transparent to the Apple (just poke the data)
- Fast conversion (.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

The D/A section contains 8 digital to analog converters, with output buffer amplifiers and all interface logic on a single card. On-card latches are provided for each of the eight D/A converters. No D/A converter could be easier to use. The on-board amplifiers are laser-trimmed during manufacture, thereby eliminating any requirement for off-set nulling.

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Our 8 channel signal conditioner is designed for use with both our A/D converters. This board incorporates 8 F.E.T. op-amps, which allow almost any gain or offset. For example, an input signal that varies from 2.00 to 2.15 volts or a signal that varies from 0 to 50 mV can easily be converted to 0-10V output for the A/D.

The signal conditioner's outputs are on a high quality 16 pin gold I.C. socket that matches the one on the A/D's so a simple ribbon cable connects the two. The signal conditioner can be powered by your Apple or from an external supply.

FEATURES

- 4.5" square for standard card cage and 4 mounting holes for standard mounting. The signal conditioner does not plug into the Apple, it can be located up to ½ mile away from the A/D.
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- Large bread board area.
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The I/O manual includes many programs for inputs and outputs.

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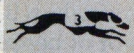

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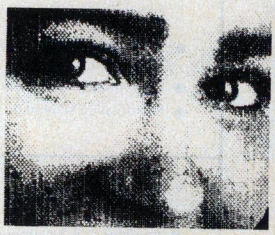

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may not know is that MCI Mail has demonstrated an E-mail exchange (using CCITT's X.400 standard) between company headquarters in Washington, D.C., and a computer in Cannes, France. This development helps MCI Mail catch up to Western Union, which signed agreements with the French Post and Telecommunications Administration last year. All this activity means that someday we'll have a commercial electronic link to Europe.

Logging Off

Telecommunications makes the world smaller all the time. You can do your part by dropping me an E-mail message on CompuServe (73537,1075) or MCI Mail (RLOCKWOOD) or by relying on the post office and writing a letter in care of *A+*. I warn you, E-mail gets priority. May your modem be true all year long. ✚

FURTHER INFORMATION

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TIPS AND TECHNIQUES

Readers share tips for the II

Welcome to the second month of our new "Tips and Techniques" section. This month we are using a sampling of tips from Bert Kersey and Bill Sanders' *The Big Tip Book for the Apple II Series* (Bantam Books, 1986) while we wait for you to send in your great tips. If we publish your contribution in this column, you'll receive credit, and we'll pay you $2500 (that typo got your attention—it should be $25.00). We are looking for your ingenious routines, insignificant tricks, Easter eggs (unusual commands embedded inside a program that cause secret messages to appear), or whatever you feel might be useful or fun for other readers.

So don't wait another day—send us your best tips to share with all the *A+* readers.

A+ magazine
Attn: Tips and Techniques
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Belmont, CA 94002

SQUEAKY DRIVE?

If your Disk II drive is driving you up the wall with a squee-eee-eak as it does its thing, it probably has a worn pressure pad. If you're good at taking things apart (aren't we all?) and getting them back together properly, take the four Phillips screws out of the bottom of your drive and slide off the metal case. Remove the two Phillips screws that hold down the horizontal green board inside. Carefully unmount the green board (watch what you're doing; you have to put it back!). It will remain connected to the drive by wires. Now, insert a disk in the drive and close the drive door. You will see the pressure pad (a little cottony thing about ¼ inch in diameter mounted on the end of a black arm) on top of the oval slot of the disk. Turn the pressure pad's black screw about a quarter turn. This should rotate it just enough to stop the squeaking. Or you can fluff the pad up with a screwdriver or something.

Warning: All of this will undoubtedly void your warranty if anyone finds out what you've done . . . but it's your equipment, right? If you mess up your drive, forget where you read this.

While you've got the cover off, watch your drive work; it's fun! INIT a disk, DELETE some file, CATALOG, and so on, and watch the pressure pad move. The read/write head is directly under the pressure pad contacting the bottom of your disk. Disk drives are indeed amazing.

IIc POWER OFF?

Did it ever occur to you that turning a IIc off using the built-in switch doesn't turn off the power supply, which is halfway down the cord . . . or does it?

SCREEN SHIFTER

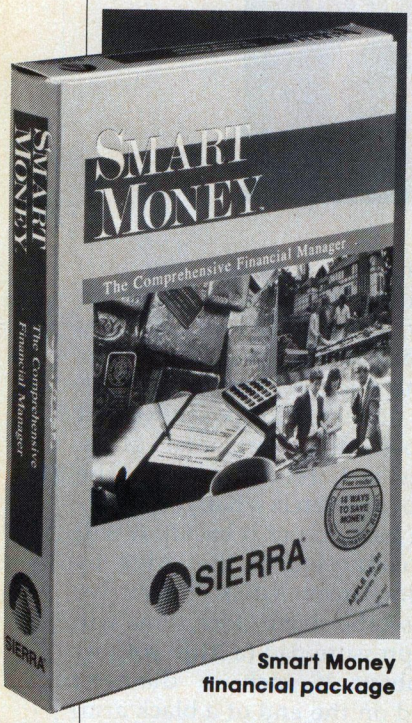
This program performs a fast, simple memory move from Applesoft, similar to the one on the PEEKs and POKEs chart. Run it and press the left arrow a few times until any character other than a space is in the upper-left corner of the screen. Then press the right arrow.

```
10  POKE 768,216: POKE 769,160: POKE 770,0:
    POKE 771,76: POKE 772,44: POKE 773,254:
    LIST : LIST
20  HTAB 1: PRINT "<- ->:";: GET A$:ST =
    1024:EN = 2046
30  DEST = 1024 + (A$ = CHR$ (21)) - (A$ =
    CHR$ (8)): GOSUB 100: GOTO 20
100 I = INT (ST / 256): POKE 60,ST - 256 *
    I: POKE 61,I
110 I = INT (EN / 256): POKE 62,EN - 256 *
    I: POKE 63,I
120 I = INT (DEST / 256): POKE 66,DEST -
    256 * I: POKE 67,I: CALL 768: RETURN
```

The left arrow moves the text screen memory down one byte; the right arrow moves it up. Because of the nature of this memory move, the upward move *copies* the value of the first byte (VTAB 1, HTAB 1) all the way through the screen.

Try pressing the right arrow when a character is in the upper-left corner of the screen.

PIPE



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Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive

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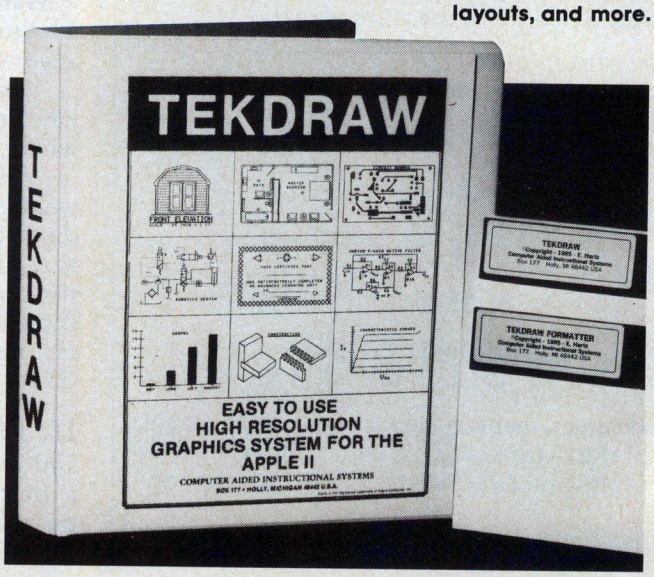
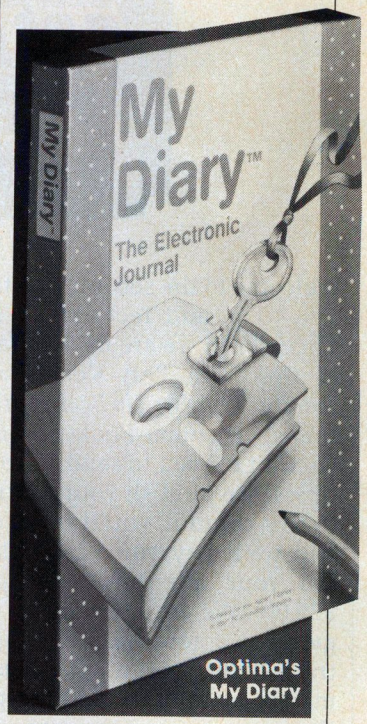
CIRCLE READER SERVICE NO. **523**

Tekdraw helps users design circuit schematics, architectural layouts, and more.





MY DIARY

An entertaining and educational program, My Diary: The Electronic Journal is designed to promote creative thought and writing skills. Users "unlock" their diary by entering a unique secret code. They can then make daily entries for up to one year and record addresses, telephone numbers, and birthdays in a separate section. Users can change days and edit text with simple commands. *(List Price: $19.95)*

Requires: Apple II Plus, IIe, or IIc

Optima Techniques, Inc.
1200 E. 104th Street
Suite 200
Kansas City, MO 64131
(816) 942-3727

CIRCLE READER SERVICE NO. **522**

LINE

ALPS AMERICA DOT-MATRIX PRINTERS

ALPS America has introduced six dot-matrix printers suitable for producing graphs, CAD/CAM printouts, forms, and project-management charts. The fast, high-resolution printers also feature letter-quality and seven-color printing, quiet operation, easy-to-use front-panel buttons, cartridge slots that accept multiple fonts, and interchangeable 18- and 24-pin printheads.

Designed for multi-user setups, the P2400C Series printer features a 4K buffer, expandable to 256K; a push-and-pull tractor feeder; and a wide carriage. The 24-pin P2424C prints draft at 360 cps, correspondence at 180 cps, and letter quality at 120 cps; the 18-pin P2418C prints draft at 250 cps and letter quality at 125 cps.

For high-volume, single-user applications, the ALQ300 Series offers a standard 7K buffer, expandable to 64K and a wide carriage. The 24-pin ALQ324 prints draft at 240 cps, correspondence at 120 cps, and letter quality at 80 cps. The 18-pin ALQ318 prints at 200 cps in draft mode and at 100 cps in letter-quality mode.

Finally, the ALQ200 Series of narrow-carriage printers for single users offers a standard 7K buffer, expandable to 64K. The 24-pin ALQ224 prints draft at 240 cps, correspondence at 120 cps, and letter quality at 80 cps, and the 18-pin ALQ218 offers draft printing at 200 cps and letter-quality printing at 100 cps. *(List Price: P2424C, $1395; P2418C, $1295; ALQ324, $995; ALQ318, $895; ALQ224, $695; ALQ218, $595)*

ALPS America
3553 North First Street
San Jose, CA 95134
(408) 946-6000

CIRCLE READER SERVICE NO. **521**

ALPS America's new dot-matrix printers offer seven-color printing.

The Sound-write Acoustical Cover Pedestal from Ring King Visibles

SOUND-WRITE ACOUSTICAL COVER PEDESTAL

Ring King Visibles has introduced the Sound-write Acoustical Cover Pedestal for use with its line of Sound-write Acoustical Covers. Available in oak or walnut wood grains, the pedestal is designed to provide mobility and storage capacity for printers housed in Acoustical Covers. The unit features adjustable storage for continuous forms, comes with double front doors, and rides on four double-wheel casters. *(List Price: $329.95)*

Ring King Visibles, Inc.
2210 Second Avenue
P.O. Box 599
Muscatine, IA 52761
(319) 263-8144

CIRCLE READER SERVICE NO. **520**

PIPELINE

HARDWARE

PROWRITER C-185 SUPRA PRINTER

Designed for multiuser business use, the ProWriter C-185 Supra is a quiet, 24-pin dot-matrix printer that prints at up to 400 cps in draft mode and up to 162 cps in letter-quality mode. It features a special diamond-shaped printhead and incorporates a 16-bit 8086 chip with one megabyte of ROM and 64K of RAM. A 42K buffer is standard. Users can select all printer functions, including a Clear Buffer function, from the front panel.

Other features include a Copy+ function that lets it handle up to six-part forms, the ability to produce true circles for pie charts, bidirectional graphics print with a resolution of 180 × 360 dpi, built-in character fonts, enlarged printing, and tractor feed. Available as options are a download font card, Font Master software, bidirectional tractor feed, and single- and dual-bin sheet feeders. *(List Price: $1995)*

The ProWriter C-185 Supra from C. Itoh

C. Itoh Digital Products
19750 S. Vermont Avenue
Suite 220
Torrance, CA 90502
(800) 423-0300
(213) 327-2110

CIRCLE READER SERVICE NO. **524**

ELECTROHOME PROJECTORS

Electrohome has released two systems for projecting data and graphics—the ECP 2000, a high-resolution color system, and the EDP-58XL, a lightweight monochrome system. Both systems offer an aspect ratio of 3:4.

The ECP 2000 has a lens capable of resolving 1024 × 1280 pixels and converges colors inside the projector instead of on the screen. Three external controls let users vary the system's focus, adjusting center, corner, and top-to-bottom optical focii for screen sizes from 5 to 14 inches diagonally. It also features electronic pincushion circuits that

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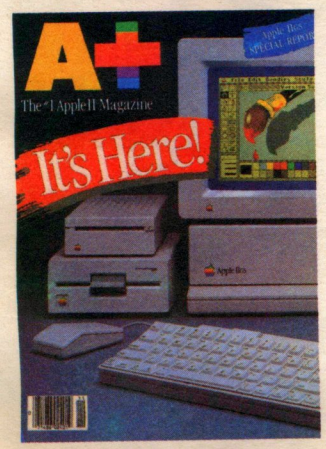

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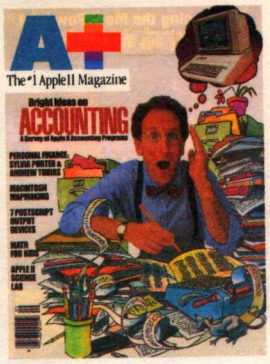

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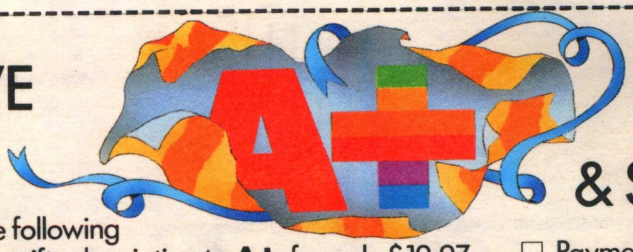

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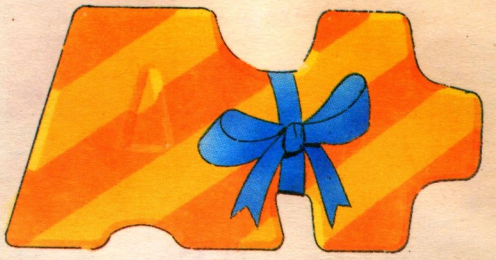

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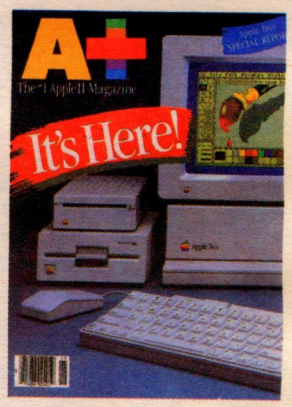

PIPELINE

correct the projected image's top, bottom, and sides for use with flat, curved, or rear screens. The projector can be mounted on a castored cart or mounted on a ceiling with an optional yoke.

The EDP-58XL projector displays a P53 green-phosphor image; P45 white phosphor is available on special order. The system offers a resolution up to 1300 lines and can be focused continuously to provide a projected picture measuring from 4.5 to 10 feet diagonally. Other features include pincushion circuits to correct distortion to within 3% and a front panel that lets users adjust the lens focus for curved or flat screens. *(List Price: ECP 2000, $11,995; EDP-58XL, $3,895)*

Electrohome (U.S.A.) Inc.
1155 S. Milliken Avenue
Suite F
Ontario, CA 91761
(714) 983-5660

CIRCLE READER SERVICE NO. **525**

QUARTERBACK

Designed to work with Apple IIc computers, Quarterback is a backup power supply that can provide the computer with power for 15 minutes. The lightweight, automatic power supply connects in series between the plug-in power supply and the IIc. When the power-line voltage falls below 103 v A.C., the device's internal battery

Quarterback, a lightweight, automatic power supply

takes over. During backup operations the unit emits a tone every 16 seconds, changing to once every 2 seconds as automatic shut-off approaches. *(List Price: $97.95)*

Requires: Apple IIc

Powersine Products
3517 Collier Avenue
P.O. Box 16887
San Diego, CA 92116
(619) 280-1646

CIRCLE READER SERVICE NO. **526**

SOFTWARE

FEDERAL TAX FORMS

SKY Computer Resources has announced the 1986 edition of Federal Tax Forms for AppleWorks users. The product comprises AppleWorks spreadsheet templates that automatically calculate and reproduce 12 commonly used tax forms and schedules. Each form or schedule is a separate desktop file containing three sections: a short set of instructions, a transfer area, and the actual form. The transfer area contains information that is required in more than one form, and the software

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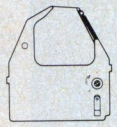

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PIPELINE

automatically places this information in the appropriate location on the form.

Each form and schedule is a duplicate of the IRS tax form and can be used in place of it. *(List Price: $39.95)*

Requires: Apple IIe, IIc, or III (with III EZ Pieces); 128K RAM; AppleWorks; printer optional

SKY Computer Resources
P.O. Box 204
Portland, OR 97207
(503) 234-7291

CIRCLE READER SERVICE NO. **527**

DESKTOP

The first in Simple Software's series of desktop tools for the IIGS, DeskTop features an enhanced calculator; a control panel; a system lock that provides password security; a chart of ASCII codes in character, decimal, and hex; a scrapbook that lets users cut and paste pictures and text among applications; a notepad; a cursor editor; a puzzle; and more. Users install all tools on and select them from the Apple icon on the menu bar of their application. *(List Price: $29.95)*

Requires: Apple IIGS

Simple Software
4612 N. Landing Drive
Marietta, GA 30066
(404) 924-2667

CIRCLE READER SERVICE NO. **535**

ON BALANCE PERSONAL-FINANCE PROGRAM

On Balance is a fast, easy-to-use, personal finance program with information screens that work and look like a checkbook register.

Users can create up to 175 accounts and can change names and types of accounts at will. They can define any account as an asset, liability, income, or expense and can flag any tax-related expenditures for easy recall at tax time. Each month users can enter up to 800 financial transactions, and they can store an entire year's data on one disk.

The program displays on-screen warnings when recurring transactions, such as mortgage payments, are due and can update records automatically. In addition to keeping records and paying bills, the program works as a financial-planning tool for creating monthly and annual budgets. On Balance can also print a variety of reports and is compatible with AppleWorks. *(List Price: $99.95)*

Requires: Apple IIe or IIc, 128K RAM

Brøderbund Software
17 Paul Drive
San Rafael, CA
94903-2101
(415) 479-1170

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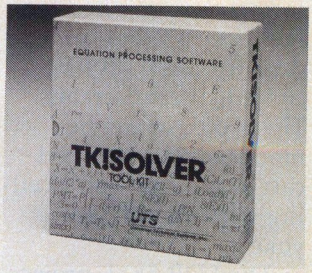

The equation-processing package TK!Solver

TK!SOLVER

Universal Technical Systems has reduced the price of its equation-processing software package TK!Solver. The program is suitable for such applications as financial management, engineering, physics, and science. *(List Price: $99)*

Requires: Apple IIe or IIGS

Universal Technical Systems, Inc.
1220 Rock Street
Rockford, IL 61101
(800) 435-7887
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PIPELINE

VIDEOFILE

VideoFile lets users catalog VHS or Beta VCR tapes. Users can generate lists of shows, in order of length or alphabetically, on-screen or on a printer. VideoFile can also find spaces on tapes for new recordings, delete shows, translate VCR counter numbers into hours and minutes and vice versa, find shows, and display a status report about tapes' contents. *(List Price: $39.95, $10 for demo disk)*

Requires: Apple II, II Plus, IIe, or IIc; 64K RAM

VideoFile
P.O. Box 480210
Los Angeles, CA 90048

CIRCLE READER SERVICE NO. **419**

GUNSLINGER

In Gunslinger, the player takes on the role of Kip Starr, a retired Texas Ranger whose only wish is to spend the rest of his days in peace. His wish is not to be granted, though. He learns that his best friend will be hanged in two days unless Kip can rescue him and that the six Dalton brothers are on their way to settle old scores with him. During the game, Kip must travel through a ghost town, explore a deserted mine, negotiate with hostile Indians, and escape from an army fort, all the time avoiding ambushes by the Daltons.

Gunslinger, an adventure game from IntelliCreations

The game uses a split-screen format with graphics in the upper-left section, command choices on the right, and text at the bottom. *(List Price: $29.95)*

Requires: Apple II Plus, IIe, or IIc; 64K RAM

IntelliCreations, Inc.
19808 Nordhoff Place
Chatsworth, CA 91311
(818) 886-5922

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Pascal for the Apple IIGS!

TML Pascal - one of the most popular development systems available for the Apple Macintosh is now available for the Apple IIGS!

TML Pascal — $125.00

TML Pascal is a fast, one-pass native code 65816 Pascal compiler supporting full GS ROM access for developing stand-alone ProDOS16 applications and desk accessories. The compiler supports separate compilation of units, Pascal strings, type coercion, SANE, and much much more.

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TML Source Code Library — $49.00

The Source Code Library is a large collection of Pascal source code examples with complete documentation demonstrating the techniques for programming the many fascinating features of the APPLE IIGS. Examples include the use of QuickDraw, Sound, Menus, Windows, Dialogs, and many more all ready for use in your own applications.

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Marshware has released Body Systems II Series, a new three-program series of educational software for grades 4–8. The programs are The Endocrine System: The Body in Balance; The Nervous System: Our Information Network, in which Mind Master, a friendly neuron, demonstrates how information travels on neuron pathways to and from the brain; and The Blood System: A Liquid of Life, which teaches students about plasma, red and white blood cells, transfusions, and blood diseases. *(List Price: $39.95 each; complete series, $99.95)*

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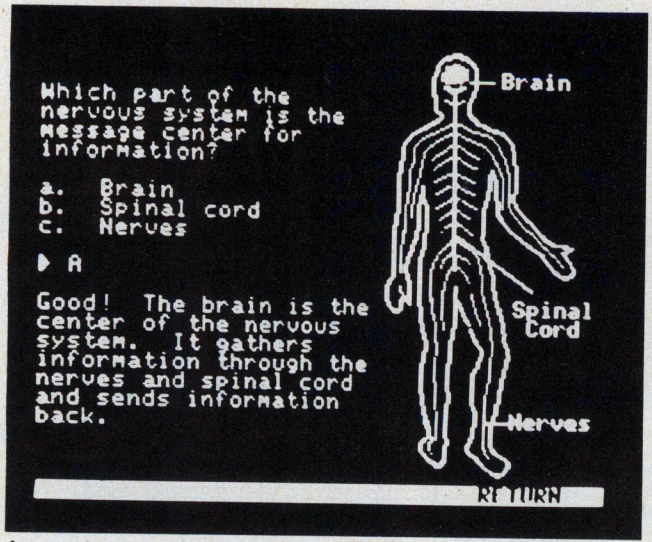

A sample screen from Marshware's Body Systems II Series

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An enhanced version of Tom Throop's Bridge Baron is now available. This computer bridge game lets the computer bid, play cards, defend, and generate more than a million random deals; alternatively, you can enter preselected deals. The new version lets you play with a partner against the computer, lets the computer keep score in rubber-bridge fashion, and offers an automatic-play mode in which the computer handles all elements of bidding and play. In addition, after playing a deal, you can switch sides and replay the same deal, and you can play either strong or weak two bids and save deals to disk. *(List Price: $49.95)*

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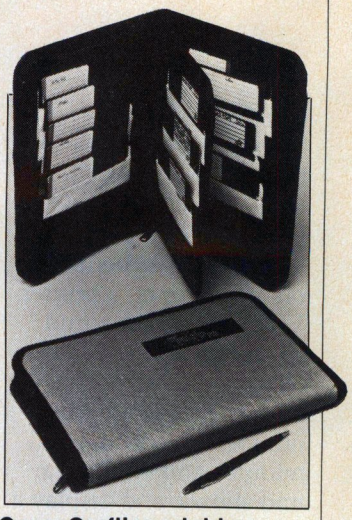
ACCESSORIES

COVER CRAFT ACCESSORIES

Amherst International's Cover Craft Division has released a new line of portable diskette libraries and added an antistatic mouse mat to its Stat-Pruf line.

Portable diskette libraries are available in three versions—Model V12090 holds up to 20 5¼-inch diskettes, Model V12095 holds up to 20 3½-inch diskettes, and Model V12135 holds up to 10 diskettes of either size. The libraries resemble small wallets that unzip and open like a book. They hold the diskettes in leatherlike pockets inside. Each library includes a shielding layer to protect diskettes from X rays, magnetic fields, and static. They are made of laminated hardboard and shock-absorbing foam and have a weather-resistant surface of Cordura nylon.



Cover Craft's portable diskette libraries

The antistatic mouse mat comes with a 6-foot resistive ground wire that continuously conducts static charges to keep static at safe levels. The mat is made of static-dissipative vinyl material that is both flame-retardant and resistant to chemicals. It measures approximately 12 × 9¼ inches and is available in brown or beige. *(List Price: Models V12090 and V12095, $36.95; Model V12135, $29.95; mouse mat, $14.95)*

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CIRCLE READER SERVICE NO. **538**

BY STEVE ROSENTHAL

THE HUMAN SIDE OF UPGRADING

Changing the technology alone is not enough

Although all it takes to upgrade an Apple IIe to a IIGS is a moderate amount of money, upgrading your own skills to make full use of this new technology may take a larger investment. And if we're all going to get the most out of the IIGS, it may take some upgrading of popular attitudes as well. Of course, if you use your IIGS only with packaged software, you don't *absolutely* have to learn anything new—and there are even some benefits that the new internal IIGS architecture provides that happen invisibly in the background, whether or not you do anything different. As long as your software is within the 90+ percent that's fully compatible, you shouldn't have any problems. Merely by learning a few keystrokes that turn on the IIGS's fast clock speed, in most cases you can run your existing programs as much as two and a half times faster. The learning investment is minimal, the results noticeable.

For a little more work (and slightly more money), you can upgrade AppleWorks or many of the other popular programs you might already have to versions that make use of the IIGS's special features. The retraining time is still small and for the most part is usually quickly paid back in greater effectiveness and throughput. The new version of AppleWorks, for example, lets you create larger spreadsheets, lists, and documents, and the larger amount of accessible memory also makes it easier for you to build large compound documents.

Research Time

The greatest time investment, in fact, for this level of change is the research and decision time—it's frequently more difficult to check into the benefits of a software upgrade, make the decision, and then actually complete the purchase than it is to learn some new extensions to an already familiar pattern. Although *A+* and other regular sources of information about Apple software cover some of the major upgrades, for other programs you'll have to do most of your research at your dealer or by reading ads.

When you get as far as considering the addition of new software written specifically to make use of the IIGS, the pattern changes slightly. Although the investigation and decision cost goes up only slightly from what it takes to decide for or against an upgrade to a familiar package, the required training time involved tends to jump sharply, especially for many of the more powerful software programs.

Although well-written software and documentation can minimize that barrier, the truth is that it does take time and effort to learn any type of complex task, on or off a computer. New programs can handle new functions or new approaches to existing tasks, but they do need an up-front investment in learning how to use them.

Luckily, Apple, building on the success of the Macintosh, has provided a recommended common user interface for IIGS software. That should cut significantly the cumulative time it takes to learn more than one new IIGS application. As on the Mac, once you learn how to work any piece of software that follows the guidelines, you'll know the basics of entering and correcting text, getting files, and saving your work.

Furthermore, the particular Macintosh-style icons and mouse interface that Apple has chosen for the IIGS should, if the Mac is any indication, prove easier for most of us to learn than the command-line style of ProDOS, DOS 3.3, and CP/M. Still, if you haven't used a Mac, plan on a little training time here as well.

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have to pick up as a user, however, are a small bit of what you'll have to learn to make best use of the IIGS as a programmer. In addition to what you already know about working with the previous members of the Apple II family, you'll have to get up to speed about a new processor, new memory architecture, and some new input and output devices. Still further, the IIGS includes much more built-in code in permanent ROM memory and in the operating environment, so you ought to change your programming style to make use of these toolbox routines instead of fiddling directly with the hardware. The new processor, the 65816, has a lot more instructions and data types than the venerable 6502 of prior Apple IIs, which gives you a lot more possibilities. If you are the hacker type, you can get more done faster, with less code.

But more power in the processor also means a lot more to keep track of at the hardware level, so if you've been doing your programming in assembler, you may want to move up a level to BASIC, C, or Pascal to keep the complexity from getting out of hand. Some speed-critical routines may still need to be written in assembler, but for the most part, the IIGS has graduated to a point at which programs are most effectively written in higher-level form.

That's particularly important with the IIGS because the greater amounts of available memory make compactness of code less of a problem, while the availability of a toolbox and a standard user interface raise our expectations for even the simplest program. It's also easier to let a higher-level language keep track of segment size and the location of code and data—in order to keep compatibility with prior Apple IIs, the IIGS uses a segmented memory architecture, but now you have the possibility of more than a hundred segments instead of the two 64K-long banks offered by the Apple IIc and IIe.

The new video circuitry also has significant extensions. You don't have to forget all you may have learned about shape tables and the peculiarities of the original Apple II video coloring scheme, because the IIGS can still work in the old modes, but you now have a video mode with a full 80 by 25 display and full color possibilities at each point. Writing for this type of display may be easier, but it still takes some learning if all you've done is write for the prior models.

If you're going to write music or make use of the new sound chip for synthesized speech, you've got an even larger jump to make. Although sound on the older Apple IIs was based on toggling individual output bits, on the IIGS you're dealing with oscillators and waveshaping circuits. You can do more—but it takes a lot more programming to set it up.

Again, none of these techniques are obligatory if you just want to continue to run your existing Applesoft and machine-language programs. Aside from some changes in the serial port to make the IIGS AppleTalk-compatible, the IIGS is really remarkably compatible with previous models in most important respects. But what the Mac software development showed is that it's a lot harder to write applications that look easy to the user than had been thought, even if you do start with a full toolbox of routines.

Finally, getting the full benefits of upgrading may call for a change in attitude as well. Although Apple may be promoting the Macintosh for business and the II series for home and education, a GS-powered Apple II has roughly the same potential for applications such as spreadsheets and databases as the widely used business machines in the IBM PC class. Unless developers see it that way, and unless enough of us choose the IIGS and make a potential market for those developers, though, we won't see the full range of software and hardware offerings that the IIGS can potentially support.

Changing the technology alone, then, is not enough. For the IIGS to be successful, it needs the requisite human resources and advances as well. To get the most out of the IIGS, you might have to learn a few new skills, and to program it well, you'll have to learn still more. Training and changing people is a lot more difficult than reprogramming silicon, and fortunately, that kind of human engineering still can't be done through mass production or in a lab. In the end, though, regardless of the hardware or software, an investment in upgrading ourselves is probably the best upgrade investment of all that any of us can make. +

Rescue Squad

BY GARY B. LITTLE

CRUISING IIc

Q. *I spend a lot of time on a yacht sailing around the Caribbean, so I would like to be able to run my IIc from a battery. Is this possible? If so, where can I buy the necessary equipment?*

Colin L. Beadon
Barbados, West Indies

A. San Diego distributor/manufacturer Roger Coats ([619] 274-1253) has a wealth of useful products that can transform the IIc into a truly portable computer, including a DC power supply. The Prairie Power System ($150) can keep your IIc powered for about 8½ hours, and you can recharge the system by plugging it into an AC wall socket. Coats also sells a special cigarette-lighter adapter ($24.95) so you can use your IIc in the car, by the way.

Keep in mind, however, that you can't run a standard monitor directly from a battery such as the PPS. What you need is Coats' C-VUE flat-panel, liquid-crystal display ($349) or Apple's LCD (Apple no longer makes it, but you might be able to buy a used one). These screens get all their power from the IIc itself. If you need a printer, try the Epson HS-80 battery-operated printer ($489).

ROM FOR Z-RAM?

Q. *I own an Apple IIc I purchased in 1984. If I bought Applied Engineering's Z-RAM, would I need the new ROM upgrade from Apple?*

Jaime Bueno
Cali, Colombia

A. As the name of Z-RAM suggests, you get RAM, not ROM, from Applied Engineering when you buy this peripheral. Apple's new ROM, which allows the IIc to use the UniDisk 3.5, is sold only by Apple or its dealers, and has nothing to do with Z-RAM. If you buy a UniDisk 3.5 from Apple, you will get the new ROM installed for no extra charge.

DEAD DRIVE DILEMMA

Q. *My IIe's second Disk II drive just stopped working, and my Apple dealer wants $55 to repair it. Do you think I should just scrap the drive and use the money I save toward buying a couple of the new 800K 3.5-inch drives instead?*

George Del Monte
Slidell, LA

A. The advantage of having a second 5¼-inch drive is that you can make backup copies of disks without having to swap disks. But with good utility programs such as Copy II Plus ($39.95 from Central Point Software; [503] 244-5782) and Diversi-COPY ($30 from Diversified Software Research; [313] 553-9460), which copy disks in two passes, making backups with one drive is not as much of an inconvenience as it used to be.

You may also need a second 5¼-inch drive if you use programs that insist on having a data disk in drive 2. If you decide to use 3.5-inch disk drives and have programs that require that the data disk be in drive 2, you can transfer the program and the data to the 3.5-inch disk and put the disk into the second 3.5-inch drive. (I'm assuming your programs aren't copy-protected; if they are, you're out of luck.)

This technique works nicely for ProDOS programs, because ProDOS automatically recognizes and works with 3.5-inch disks. For DOS 3.3 programs, you must first buy a program such as AmDOS 3.5 ($15 from RMS Software, Inc.; [604] 681-3371) that patches DOS 3.3 to make it work with 3.5-inch disks. Such patch programs don't work with all DOS 3.3 programs, however, so be careful.

The least expensive way to add two 3.5-inch drives to the IIe is to buy Central Point Software's Universal Disk Controller and two Chinon drives for $480. The equivalent all-Apple solution (two UniDisk 3.5 drives with controller card) costs $867. ✚

Gary Little practices computer law in Vancouver, British Columbia, and writes about Apples in his spare time.

Please send your questions and problems to Rescue Squad, A+, 11 Davis Drive, Belmont, CA 94002.

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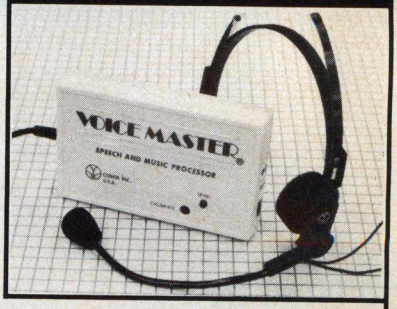

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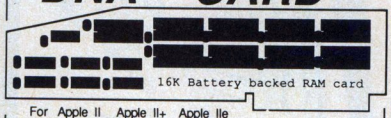

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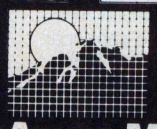

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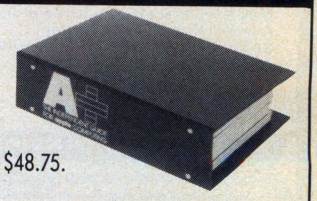

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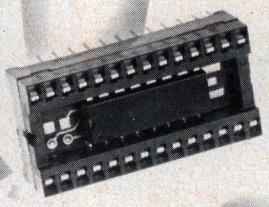

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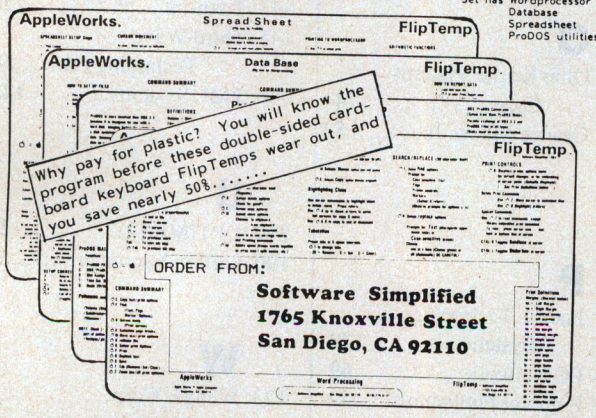

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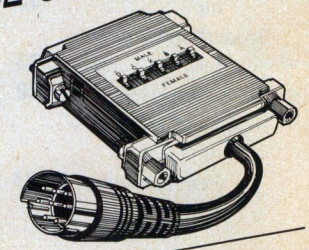

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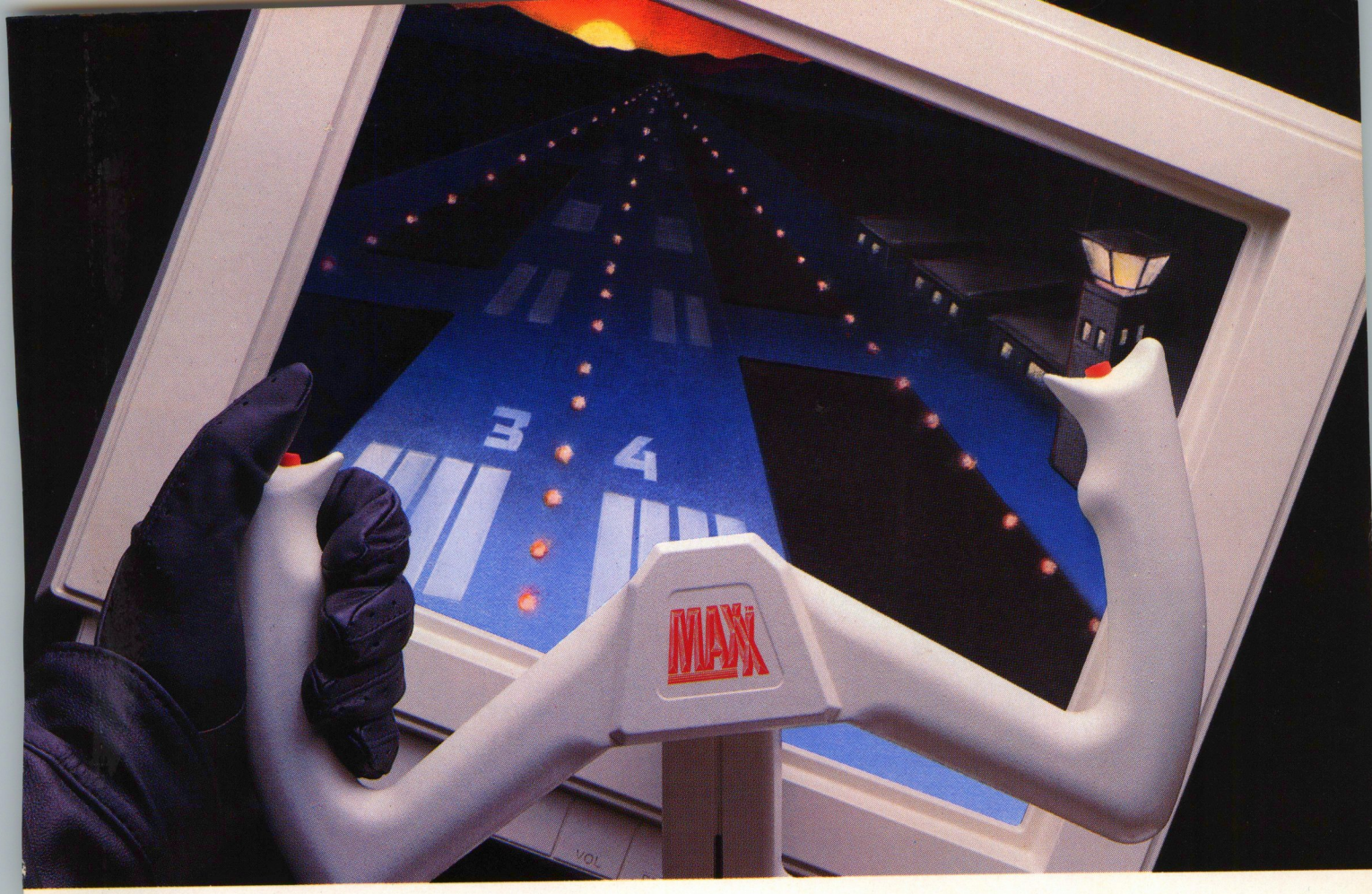

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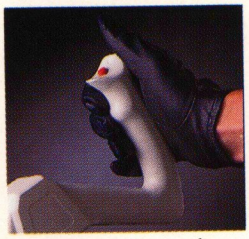

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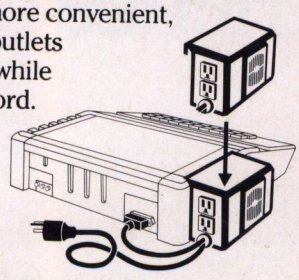
MORE THAN ¼ MILLION APPLE II's SAVED

SYSTEM SAVER® from Kensington Microware quietly protects more than 1/4 million Apple® II's every day. Often referred to as "the piece Apple forgot," System Saver's unique combination of features have made it the most versatile, most convenient, best selling accessory ever made for the Apple.

System Saver organizes your power needs.

To make your Apple system more convenient, System Saver provides extra outlets for your monitor and printer, while replacing the Apple's power cord. One front-mounted power switch controls your whole system.



System Saver solves power line problems.

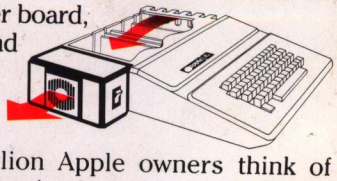
Impurities in the power supply cause 70-90% of all microcomputer malfunctions. Line noise can be interpreted as data, confusing your Apple and causing annoying system errors. Power surges and spikes can do costly damage to your computer's delicate circuitry.

System Saver clips surges and spikes at a safe level and filters out line noise. It makes your Apple more accurate, more efficient and more reliable.

System Saver keeps your Apple cool.

Peripheral cards added to your Apple not only generate heat, they block any natural air flow through the computer. The resulting high temperature conditions can potentially shorten the lives of both your Apple and your peripheral cards.

System Saver's quiet fan draws a breath of fresh air across the Apple's mother board, over the power supply and out the side ventilation slots at the rate of 17 cubic feet per minute.



More than 1/4 million Apple owners think of System Saver as the piece Apple forgot. And 1/4 million well-protected Apples agree.

For a dealer near you, or to speak to a Kensington sales representative, call toll free (800) 535-4242 In NY (212) 475-5200.

KENSINGTON™

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Also available in 220/240 Volts, 50/60 Hz.

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